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SESSIONAL PAPERS

VOLUME 5

FOURTH SESSION OF THE THIRTEENTH PARLIAMENT

OF THE

DOMINION OF CANADA

SESSION 1920

160236
28/3/21

VOLUME LVI

ALPHABETICAL INDEX

TO THE

SESSIONAL PAPERS

OF THE

PARLIAMENT OF CANADA

FOURTH SESSION, THIRTEENTH PARLIAMENT, 1920

A

	No.
Advertisements respecting voluntary enlistment, before year 1917	181
Agreement between Allies and Associated Powers, *re* cost of liberation of Territories of former Austro-Hungarian Empire	42*b*
Agreement between Allies and Associated Powers *re* Italian reparation Payments, etc	42*c*
Agriculture—Report of Department of—1919	15
Agricultural Instruction Act—1918-19	15*a*
Air Board, Report of year 1920	47*a*
" " O. in C. respecting re-organization of—1920	47*b*
" Force in Canada—O. in C. 1920 *re* organization	127
" Regulations—O. in C. relating to, 1920	47
Alberta—respecting irrigation development in	164
Antigonish, N.S.—Date of establishing Branch of P.W. Department at	101
Antigonish, N.S. and North Sydney Branches of P.W. Department at	101*a*
Appointments to Civil Service in Cities of Canada since 1915	191
Archives, Department of, Ottawa—number of employees in, salaries, etc	170*c*
Arms Traffic Convention—Protocol *re*—1919	42*c*
Assets of Canada—Total Amount, interest, etc from 1910—average to present time	137
Auditor General's Report, Vol. I, Pt A-B—A-to J	1
" " " II, Pt. K to S	
" " " III, Pt. T to Z	
" " " IV, Pt. ZZ	
Automobiles—respecting the amount of excise duty collected on, in 1918-1919	2*a*

B

Banks, chartered—number of, profits, etc. years, 1911-12-13-14-15-16-17-18-19	122
Beatonville P.O., Inverness Co., N.S., respecting site of	149
Becker & Co., London, England—Copy of correspondence between, and Government	77
Berlin and Brussells Acts Convention—1919	42*c*
Board of Commerce—*re* resignation of Chief Commissioner of, etc	48
Board of Commerce of Canada, First Annual Report of—and O. in C. accompanying same	205
Bonds and securities, statement *re*, 1919	69
British House of Commons—Resolutions of thanks passed by, to troops in late war	114

C

Canadian Expeditionary Forces—*re* payments to—respecting rate of exchange	90
Canadian Expeditionary Forces—Copies of Routine Orders promulgated—1919-1920	94
Canadian Expeditionary Forces—Appointments, Promotions and Retirements—1919-20	95

C

	No.
Canadian Government Merchant Marine Ltd.—Report of Directors of	161
Canadian Militia—Promotions, Appointments and Retirements—1919-1920	95
Canadian Munition Resources Commission—Report year 1915 to 1919	184
Canadian Munition Resources Commission O. in C.—Copy of dissolving same, 1920	184*a*
Canadian National Railways—*re* amount of work on certain lines of	97
Canadian Naval Service—number of vessels of, during war—names, etc	117
Canadian Naval Service *re* gratuity to warrant officers of	43
Canadian Northern Railway Company *re* mortgage deeds granted by Government to, 1918-1919	175
Canadian Northern Railway System—Report of Directors for year 1919	160
Canadian Securities once held in Great Britain, now by U. S. of America	89
Canadian Silver Coinage—defining standard of	76
Canal Statistics, season of navigation, 1919	20*a*
Captain Superintendents H M C. Dockyards—*re* payments to	43
Carvill, George—respecting dismissal of from position of Ticket Agent at St. John	134
Census of Industry, Pulp and Paper	17(43)
Chippewa—Indians—Agreement between and Government—*re* surrender of Sarnia Indian Reserve	207
Civil Service Commission—Annual Report of, 1919	32
" " number of persons employed on—names and salaries	120
Civil Service Commission, *re* correspondence with, respecting classification of Civil Service	90
Civil Service Investigation Commissions—No. of appointed since 1895	166
Civil Service Insurance Act, Statement in pursuance of	51
" Number of Classification engineers employed in re-classification of	98*a*
Civil Service, respecting names, salaries, etc., of men employed to re-classify same	228
Coal operations—Orders of the Director of—No. 1 to 144 inclusive	202
Coal—Production of in Canada past 10 years—Total Exportation and importation of past 10 years	163
Commissions—re date and object of appointment of since 1911 to date	65
Commissions—*re* date and object of appointment of since 1912 to date	65*a*
Commissions—*re* date and object of appointment of since 1914 to date	65*b*
Commissions—*re* date and object of appointment of since 1911 to date	65*c*
Commissions of Enquiry—*re* cost of reporting, translating, etc., since 1906	141
Conner, Jas., *re* dismissal of, etc	82
Cost of Living Bonus for Civil Service Employees, years 1920-21	193

C

No.

Court Martial—*re* trials by of certain Riflemen of Canadian Siberian Force, 1919 . . . . . 96a
Consolidated Debt, of Canada—Amount of in gross—also net, etc 106
Correspondence, copy of between Prime Minister, and Prime Minister of Gt. Britain 211
Customs and Inland Revenue—Report of 1919 11
" Shipping Department, Report of, 1919. . . . 11a

D

Departments of the Government—number of non-Canadian-born in—Engineers, etc. 214
Department of Health—*re* sum of $200,000 for combatting Venereal Disease 206
Demonstration Farm at Baie St. Paul, Co. of Charlevoix 195
Deputy Postmaster at Edmonton, Alberta—*re* appointment of 186
Dillon, John A., respecting retention as Fishing Overseer in Co. of Guysborough, N.S. 199
Dismissals of Civil Servants in Cities of Canada since 1915 191
Dog-Fish Reduction Works—Clark's Harbour, N.S.. 180
Dominion Council of Health—O. in C. appointing same, 1919. . . . . 93a
Dominion Lands Survey Act—O. in C. respecting . . 74
Dominion Lands Act—O. in C. respecting 75
Dominion Manufacturers Association—respecting—appeals connected with, from Supreme Court . . 153
Dominion Railways Commission—*re* proceedings and evidence, at Ottawa in 1911, and 1919 . . . . . 136a

E

Edmonton, Alberta, *re* theft of $50,000 from post office at 187
Election, Return of the Thirteenth General. 3*b*
Emergency Fund for re-establishment of Soldiers—amount overpaid to those not entitled. 125
Estimates of Canada 3
" Supplementary 5
" " 5
" Further Supplementary 5*a*
" " " " 5*b*
Exchequer Court of Canada—Rules and Orders of . . 58
" " " " 58*a*
Experimental Farms, Report of, 1919 16
Explosives Division, Dept. of Mines—Report of year 1919 110
External Affairs—Report of Department of, 1919 34

F

Federal Government of Canada—Respecting number of persons employed by—both sexes. 85
Federal Housing Scheme—Orders in Council respecting. 194
Feed for Live Stock—in Southern Alberta—cost of in years 1918-19-20. 104
Ferry, Steamboat—between Ste. Catherine and Tadousac 173
Finance Department—number of employees in—including Insurance Dept. 158*f*
Fiset, Dr. Michel—respecting appointment of in 1914 as Parcel Post Supervisor, Quebec City 204
Fisheries Branch at Ottawa—names, salaries, etc. of, years 1919-20. 156
Forbes, J. L. A.—Reports concerning indemnity paid to widow of. 209
Forest Reserves and Parks Act. 72

G

Gagnon, F. X.—correspondence between and Govt., *re* Military exemption 129
Geographic Board—Report of—including all decisions from 1917 to 1919. . . . . 25*b*
Geological Surveys Branch, Department of Mines, year 1919. 26
Generals—number of retiring, also number of promoted, etc., since six months past 183
Governor-Generals Warrants—Statement respecting—1919-20 51
Grain Supervisors of Canada, Board of, O. in C. appointing, 1919 68
Grand Etang Harbour, N.S., *re* improvements on, years 1918, 1919, and 1920 224
Grand Trunk Ry. Co. of Canada—Agreement between Government and. 46

G

No.

Greece—*re* Contract between Canadian Wheat Board and Govt. of Canada respecting Wheat 86
Greece—amounts loaned, or credits given to—dates of, etc. 147
Griffenhagen and Associates—O. in C. *re* contract with, by Government. 216

H

Halford, H. J.—O. in Co. appointing as member of Dominion Council of Health 93*a*
Halifax Graving Dock—*re* expropriation of. . . . 234
Harbours of Halifax, St. John, Quebec, Montreal, Toronto, Hamilton, Port Arthur, Vancouver, Amount of money spent in since Confederation . . 201
Harbour Commission of Quebec—Documents *re* construction of Docks, Elevators, etc 131
Headquarters, Militia Department at Ottawa,—names of all officers employed at. 91*a*
Highlanders—78th Regt. of Pictou, N.S. *re* names of officers of, etc 142*a*
Highlanders—78th Regt. of Pictou Co., N.S. *re* names of officers of. 142
Historical Documents Publication Board—Annual Report of. 36
Houses—number of commenced and finished under Act of 1919 113

I

Imperial News Service—Correspondence respecting establishment of same 185
Income Tax—Number of companies and persons paying in Toronto 111
Inspectors of Terminal Elevators—*re* authority of. . . 178
Immigration and Colonization—Report of Department of, 1919 18
Indian Affairs—Report of Department of—1919. . . 27
Indian Affairs—Respecting number employed in Department of—salaries, etc. 170
Insurance Abstract of Statement of year 1919 . . . 9
Insurance—Report of Superintendent of—1918. . . . 8
Insurance showing names of societies complying with provisions of Insurance Act, also, those which have neglected to do so, etc 231
Interior—number of employees in service of Department of—inside 158*d*
Interior—number of employees in service of Department of—in Ottawa. 170*b*
Interior—Report of Department of—1919 25
International Opium Association—Copy of, etc . . 45
International Joint Commission *re* development of St. Lawrence River—O. in C. 78
International Labour Conference at Washington—Draft Conventions, etc 100
International Labour Conference nt Washington—Names of Canadian Representatives at . . . 100*a*
Intoxicants into N. West Territories—*re* permits granted for—1919. 60

J

Jellicoe—Admiral—Report of respecting Naval Mission to Canada 61
Justice, Department of at Ottawa—number of employees in 170*b*

L

Labour, Department of—Number of employees in, etc 158
Labour, Department of—Number of employees in, names, salaries, etc 170*a*
Labour, Department of—Report for year 1920 . . . 37
Lady Evelyn, Steamer, Documents *re* carriage of mails, etc. to Magdalen Islands 177
Lawyers, acting as public representatives in Military Service trials—salaries, etc 192
League of Nations—Apportionment of expenses of, also *re* Canada's share in 115
Librarians of Parliament—Report of—1919 41
Life Saving Station at Cheticamp, N.S. respecting closing of. 224
Liquor Traffic Convention—Protocol *re* traffic in Africa—1919 . . . . . 42*d*
Loans negotinted by Government since 1911 . . . 108
Lobster Hatchery—sale of at Charlottetown, P.E.I. 116

M

	No.
Mabou, and Whycocomah, N.S.—Documents *re* mail route between	148
Mail carriers—County of Charlevoix-Montmorency, number of	63
Mail Bags—*re* transfer of from C.P.R. to trains at Iberville Junction—1917-1918	120
Marine and Fisheries, Report of Department of—1918-19—Marine	21
Marine and Fisheries—Steamboat Inspection Report (Marine)—1918-19	23
Marine and Fisheries, Department of—number of employees in inside service of	158*b*
Marine and Fisheries, Department of—number of employees in at Ottawa	170*b*
Marine and Fisheries, List of Vessels year 1919	22
Mariners—sick—amount of dues from shipping in Canadian Ports in—1912-13-14-15-16-17-18-19	190
Married Women—No. of in employ of Government—Salaries, etc	167
Metabetchouan—respecting appointment of Postmaster at	99
Mewburn, Hon. S. C.—resignation of	71
Metagama Stmr. *re* complaints of soldiers sailing on—February 8, 1919	189
Militia Council—Report of year 1919	36
Militia Department—*re* officers retained, who have not been overseas	91
Militia Department—General Orders promulgated—1919-1920	94
Militia Department—Number of employees in Inside Service of	158*b*
Militia and Defence—Memo. *re* European War—1918-1919	179
Mines Branch Department of Mines—Annual report	75*a*
Mines, Department of in Ottawa—number of employees in, etc	170*f*
Miscellaneous Unforeseen Expenses—Statement respecting—1920	52
Missisquoi Bay—*re* seine or net fishing in	200
Mixed Fertilizers—*re* values of exportation of years—1916-17-18-19, etc	64
Montreal Gazette—respecting names of publishers of, and amounts paid to in last 5 years	172

Mc

McLean, Hon. A. K., resignation of	71
McNutt, Dr. L. W., Vancouver, B.C.—correspondence *re* claim of against Government	157

N

National Battlefields Commission—1919	54
" " " —1920	54*a*
Naval Service—Report of Department of 1919	39
" —number of employees in—Ottawa	170*g*
" Fisheries Branch, Report of Department of, 1919	40
Naval Mission to India—correspondence with British Admiralty respecting	176
Newspapers—Amounts paid to following—years, 1919 and 1920—"Montreal Gazette," the "Gazette Printing Co.," "Montreal Daily Star," "The Globe," Toronto, "Mail and Empire" of Toronto, "Telegram," of Toronto, "Star" of Toronto, "The Journal" and "The Journal Press," Ottawa, and the "Citizen," Ottawa	226

O

O'Connor, W. F.—copy of O. in C. accepting resignation of same	212
Orders in Council:—	
re payment of Command Money to Captain Superintendents	43
Cancellation of payment of Separation Allowance dependents in Naval Service	43*a*
Naval Forces of Canada, placed on peace footing	43*b*
Ottawa Improvement Commission—Report of year 1919	55
Outside printing done for Government during years 1918-19	146

P

	No.
Parent, Elisée, Inspector of Inland Revenue—papers *re* dismissal of in 1916	152
Parent, Elisée, Inspector of Inland Revenue—supplementary Return, etc	152*a*
Parliamentary Library—number of employees in, salaries, etc	188
Peace Conference—Declaration by Supreme Council of, on Economic Conditions	143
Peace Treaty—	
Copy of between Allies and Bulgaria—1919	42
" " Serb-Croat-Slovene—1919	42*b*
" " Czecho-Slovakia—1919	33
Penitentiaries, Report of Minister of Justice, as to year, 1919	34
Port of Canso, N.S.—*re* appointment of Harbour Master at	81
Postmaster-General—Report of—1919	24
Prince Edward Island—*re* appointment of Lieut. Governor for	227
Printing Bureau, Govt.—number of dismissals from, starting January 1 to March 1, 1920	119
Proprietary or Patent Medicine Act—*re* appointment of Advisory Council, etc	93*a*
Public Accounts of Canada	2
Public cross road between Ste. Catherine and Tadoussac—O. in C. respecting	102
Public Health:—	
Number of employees in Department of, etc	170*n*
Orders in Council relating to organization and work of	93
Public Printing—number of persons employed in Department of—names and salaries	170
Public Printing and Stationery—Report of Department of, year 1919	33
Public Works:—	
Report of Department of, 1919	19
Names of tenderers for, in Co. of Montmorency, Que.	92
Number of employees in Canada from 1915 to 1920	196
Number of names and salaries throughout Canada, up to January, 1920	196*a*
Number of names and salaries in Ottawa	170*k*
Public Service—number of employees in Departments of, subject to new classification of	217
Postmasters—names and P.O. addresses of, appointed in N.S. since 1917—also documents *re* aumber of in County of Charlevoix—Montmorency	62
Postmasters—*re* salaries paid to	132
Post Office Department—number of employees in inside service of	158*a*
Post Office Department at Ottawa—number of employees in, salaries, etc.	170*o*
Post Offices—number of north of St. Lawrence from Tadoussac to Esquimaux Point	112
Pound Sterling, British—Value of in Canadian currency in last of 1914, and in years 1915-17-18-19	124
Prince Edward Island—respecting names of persons from, passing Civil Service Exams	165

Q

Quebec and Saguenay Railway *re* curtailing of service on since November, 1919	197
Quebec, Board of Trade of City of, *re* letter to Minister of Trade and Commerce *re* Mail Steamers	155
Quebec, City of—correspondence *re* Dam on St. Charles River	88
Quebec, Riots of 1918—respecting claims for damages, etc., incurred in	140
Quebec *re* copy of letter of Western Senators and Members of Commons, respecting routing shipments via	171

R

Radiotelegraph Regulations—Amendments to	44
"	44*a*
Railways and Canals—number of employees in Department of in Ottawa	170*j*
Railways and Canals—Report of Department of, 1919	20
Railway Statistics of Canada, year 1919	20*b*
Railway Commission—respecting sessions of, relating to compensation for damages caused by C.N. Ry	208
Railway Commission—respecting sessions of relating to compensation for damages caused by C.N. Ry. passing through North Bay	208*a*
Railway Commissioners:—	
Report of Board of, year 1919	20*c*
Report of, year 1919	

R

	No
Report of *re* fixing of rates for carriage of mails by C.P.R. and G. Trunk Rya.	136
Railway Belt, 40 miles in Province of B.C.—O. in C. respecting	73
Railway between St. Camille, Que., and Cabano, Co. of Temiscouata	135
Railway Station—"The Palais" at Que. *re* construction of	80
Remissions and Refund of Customs Duties, year 1918	83
Revenue—total estimate for 1891-1896-1901-1906-1911-1912-13-14-15-16-17-18-19; also expenditure, etc.	105
Richibucto Beach, N.B., *re* closing of the life saving station at	218
Riethdorf, Prof. F. V., papers, letters, etc., naturalization of, etc	121
River Batiscan—Champlain Co., respecting Bridge over	79
River Batiscan—Champlain Co., Reports, correspondence, etc	79a
Robson, Judge, correspondence *re* resignation of, as Chairman of Board of Commerce	48a
Roumania—Amounts loaned or credits given to—dates, etc	147
Royal Canadian Navy—O. in C.—1920, *re* engagement of Seamen in	43d
Royal Canadian Navy—O. in C.—1920, *re* amendment to pay of Sergeant Lieutenants of	43e
Royal Commission on Indian Affairs for Province of B.C	66
Royal North West Mounted Police—Report of 1919	28
Royal Society of Canada—Report of 1919	56
Running Race Meets—Report and Evidence of Commission to enquire into conditions *re*	67
Rural Mail Carriers—*re* salaries, etc., paid to	132
Rural Mail Routes—Reports *re*, in Parishes of Champlain, Batiscan and St. Luc, Quebec	213

S

	No
Scientific and Industrial Research—Report of Chairman for Council of, year 1920	222
Secretaries—Private, Number of to Members, chairmen, or members of commissions, since 1911	225
Secretary to Deputy Minister of Justice—Documents respecting promotion of	163
Secretary of State, Report of Department of—1919	29
Secretary of State, Department of—number of employees in	158b
Secretary of State Department of—number of employees in	170
Seed Grain—Cost of providing for settlers in Lethbridge in 1918-19-20	104
Sentences commuted of prisoners to be hanged—number of—1916-17-18-19	118
Siberia Expedition to—number of men composing it, voluntarily or otherwise—Cost of expedition to, etc.	96
Siberia, Expedition to—Trial by Court Martiul of Riflemen attached to Expedition to—1919	96a
Soldiers Civil Re-establishment—Report of Department of—1919	14
Soldiers Civil Re-establishment *re* institutions under jurisdiction of, etc	159
Soldiers Civil Re-establishment—Number of persons employed in Department of in Ottawa	170b
Soldiers Settlement Act—Number of farms in Quebec purchased by returned soldiers	145
Soldiers Settlement Board—Correspondence between, and Minister Lands, Province Quebec	107
Soldiers Settlement Board *re* number of persons employed by in Province of Quebec	133
Spirituous Liquors: quantity of imported into Canada years 1913-14-15-16-17-18-19	151
Superannuation and Retiring Allowances—Statement respecting, to Dec. 31, 1919	49
Superannuation and Retiring Allowances *re* additional years granted under	49a
Superior Courts of Criminal Jurisdiction—Copies of Rules of	210
Supreme Court of Nova Scotia—Rules of *re* Controverted Elections Act	59
Supreme Court of Nova Scotia—Rules of Judges of *re* Criminal Code	59a

St. and Ste.

	No
Ste. Catherine and Tadoussac—*re* subsidy connected with ferry between	173
Ste. Catherine and Tadoussac, respecting postal ferry service between	19
St. Charles river—Quebec, *re* construction of a dam on	88
Ste. Anne de Beaupre, Ste. Famille, Ile d'Orleans, St. Francois du Sud, Ile d'Orleans, St. Jean, Ile d'Orleans, Ile de la Quarantine, and Pointe aux Trembles, names of tenderers for public works at—amounts of, etc	92
Ste. Anne de Bellevue *re* Military Hospital at,—cost of, number of patients at	220
St. John and Quebec Ry., N.B., *re* procuring running rights of, over C.P.Ry. to enter St. John	220

T

	No
Temporary Appointments—number of made by commission since Armistice still on pay-rolls	182
Temporary Loans since last session of Parliament	53
Textile Manufactures—*re* drawbacks paid to on raw wool and cotton, year 1920	215
Toronto Harbour—*re* work of development of under present scheme of work	219
Trade and Commerce—Report of relating to subsidies and Steamship Subventions, for year 1919	10a
Trade and Commerce—Trade of Canada (Imports for consumption and exports) for the year ending March 31, 1919	10b
Trade and Commerce—Criminal Statistics for year ended September 1919	10d
Trade and Commerce—Report of the Weights and Measures, Electricity and Gas Inspection Services, year 1918-19	10e
Trade and Commerce—Report of the Dominion Statistician year 1918-19	10f
Trade and Commerce—Department of—number of employees in, salaries and names	170d
Trade and Commerce—Department of—number of employees in, salaries and names	158g
Trade Commission overseas—*re* purposes of creation, etc	128
Transcontinental Ry., Commission—correspondence *re* Ry. Station at Champlain Market, City of Quebec—also Elevators, etc.	130
Translators—number of in Senate, House of Commons, and different Depts. of Government, etc	154
Treaty between Allies, and Associnted Powers and Roumania, Dec. 9, 1919	42g
Treaty of Peace between Allies and Bulgaria—1919	42
" " " Czecho-Slovakia—1919	42a
Treaties and Conventions—Return *re* ratification of—1920	42f
Tunnel, construction of in City of Quebec connected with Transcontinental Ry	84

U

	No
Unforeseen Expenses—Miscellaneous Statement *re* 1920	52

V

	No
Venereal Disease—*re* sum of $200,000 placed with Health Department for combatting	206
Veterinary Director General—Report of year 1919	15b
Victory Loan—1919—Total cost and general expenses of	109
Victory Loan—Appointment of Special Committee respecting stabilizing Loan of 1917	168
Victory Loan—Total amount of commission charges paid to brokers and agents, 1919	138

W

	No
War Purchasing Commission—Sales of Military and other supplies made by in 1917-18-19	162
War Records Office, Canadian—Reports by Officer in charge, London, England	169
War Revenue Stamps—*re* prosecutions in N.S. for neglect in placing on Medical Packages	125
Wharves on St. John River, etc., *re* liability of Dominion Government for	87
White, A. V., consulting Engineer of Conservation Commission—*re* expenses, etc. of	144

Y

	No
Young, Arthur & Company—Names, cost, amounts paid to, etc	139
Yukon, Ordinances of Territory of, year 1920	223

LIST OF SESSIONAL PAPERS

Arranged in Numerical Order, with their Titles at Full Length; the Dates when Ordered and when Presented to the Houses of Parliament; the Name of the Senator or Member who moved for each Sessional Paper, and whether it is Ordered to be Printed or not Printed. Also those Printed but not Presented.

CONTENTS OF VOLUME 1.

(*This volume is bound in three parts*).

1. Report of the Auditor General for the year ended March 31, 1919, Volume I, Parts a-b—A to J. Presented by Sir Henry Drayton, March 19, 1920. *Printed for distribution and sessional papers.*

Report of the Auditor General for the year ended March 31, 1919, Volume II, Parts K to S. Presented by Sir Henry Drayton, March 29, 1920. *Printed for distribution and sessional papers.*

Report of the Auditor General for the year ending March 31, 1919, Volume III, Parts T to Z. Presented by Sir Henry Drayton, March 16, 1920. *Printed for distribution and sessional papers.*

Report of the Auditor General for the year ended March 31, 1919, Volume IV, Part ZZ Presented by Sir Henry Drayton, May 14, 1920. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 2.

(*This volume is bound in two parts*).

2. The Public Accounts of Canada, for the fiscal year ended March 31, 1919. Presented by Sir Henry Drayton, March 2, 1920. *Printed for distribution and sessional papers.*

3. Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1921. Presented by Sir Henry Drayton, March 22,1920. *Presented for distribution and sessional papers.*

4. Supplementary Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1921. Presented by Sir Henry Drayton, April 15, 1920. *Presented for distribution and sessional papers.*

5. Further Supplementary Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1920. Presented by Sir Henry Drayton, May 17, 1920 *Printed for distribut on and sessional papers.*

5*a*. Further Supplementary Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1921. Presented by Sir Henry Drayton, June 25, 1920 *Printed for distribution and sessional papers.*

5*b* Further Supplementary Estimates of sums required for the service of the Dominion for the year ending on the 31st March, 1921. Presented by Sir Henry Drayton, June 29, 1920 *Printed for distribution and sessional papers.*

8. Report of the Superintendent of Insurance of the Dominion of Canada for the year ended December 31, 1918. Volume 1, Insurance Companies other than Life; Volume II, Life Insurance Companies. Presented by Sir Henry Drayton, March 2, 1920. *Printed for distribution and sessional papers.*

9. Abstract of Statements of Insurance Companies in Canada, year ending December 31, 1919. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 3.

10*a* Report relating to Mail Subsidies and Steamship Subventions as controlled by the Department of Trade and Commerce, for the year ended March 31, 1919, with Traffic Returns, etc., to December 31, 1919. The Senate. *Printed for distribution and sessional papers.*

10*b*. Annual Report of the Trade of Canada (Imports for consumption and Exports) for the fiscal year ended March 31, 1919 *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 4.

10*d*. Criminal Statistics for the year ended September, 1919. *Printed for distribution and sessional papers*

10*e*. Report of the Weights and Measures, Electricity and Gas Inspection Service, for the fiscal year ended March 31. *Printed for distribution and sessional papers.*

10*f*. Report of the Dominion Statistician for the year ended March 31, 1919. *Printed for distribution and sessional papers*

11. Annual Report of the Department of Customs and Inland Revenue, containing accounts of revenue with statements relative to the Imports, Exports, Customs and Inland Revenue of the Dominion of Canada, for the fiscal year ended March 31, 1919, as compiled from official returns. Presented by Hon. Mr. Burrell, March 4, 1920. *Printed for distribution and sessional papers.*

11*a*. Shipping Report of the Department of Customs, containing Statements of Navigation and Shipping of the Dominion of Canada for the fiscal year ended March 31, 1919, as compiled from official returns. Presented by Hon. Mr. Burrell, March 4, 1920 *Printed for distribution and sessional papers.*

13. Return of the Thirteenth General Election for the House of Commons of Canada, held on the 17th day of December 1917. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 5.

14. Report of the Work of the Department of Soldiers' Civil Re-establishment, December, 1919. Presented by Mr Clark (Bruce), March 15, 1920 *Printed for distribution and sessional papers.*

15. Report of the Minister of Agriculture for the Dominion of Canada, for the year ended March 31, 1919. Presented by Hon. Mr. Tolmie, March 9, 1920. *Printed for distribution and sessional papers.*

15*a*. Report on "The Agricultural Instruction Act," 1918-19, pursuant to Section 8, Chapter 5 of 3-4 George V. Presented by Hon. Mr. Tolmie, March 9, 1920..... *Printed for distribution and sessional papers.*

15*b*. Report of the Veterinary Director General, year ending March 31, 1919... *Printed for distribution and sessional papers.*

16. Report of the Dominion Experimental Farms for the fiscal year ending 31st March, 1919. Appendix to the Report of the Minister of Agriculture. Presented by Hon. Mr. Tolmie, March 9, 1920. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 6.

17*c*. Census of Industry—Pulp and Paper..... *Printed for distribution and sessional papers*

18. Annual Report of the Department of Immigration and Colonization, for the fiscal year ended March 31, 1919 Presented by Hon. Mr. Calder, March 3, 1920..... *Presented for distribution and sessional papers.*

19. Report of the Minister of Public Works on the works under his control for the fiscal year ended March 31, 1919. Presented by Hon. Mr. Reid, March 10, 1920..... *Printed for distribution and sessional papers*

20. Annual Report of the Department of Railways and Canals, for the fiscal year from April 1, 1918, to March 31, 1919. Presented by Hon. Mr. Reid, May 20, 1920... *Printed for distribution and sessional papers.*

20*a*. Canal Statistics for the season of navigation of 1919 ... *Printed for distribution and sessional papers*

20*b*. Railway Statistics of the Dominion of Canada year of 1919 *Printed for distribution and sessional papers*

20*c*. Fourteenth Report of the Board of Railway Commissioners for Canada, for the year ending March 31, 1919 Presented by Hon. Mr. Reid, March 19, 1920... *Printed for distribution and sessional papers*

CONTENTS OF VOLUME 7.

20*d*. Fifteenth Report of the Board of Railway Commissioners for Canada, for the nine months ending December 31, 1919. (Manuscript copy.) Presented by Hon. Mr. Reid, April 19, 1920.

21. Fifty-second Annual Report of the Department of Marine and Fisheries, for the year 1918-19—Marine. Presented by Hon. Mr. Ballantyne, March 1, 1920. *Printed for distribution and sessional papers.*

22. Marine and Fisheries—List of Vessels, year 1919 *Printed for distribution and sessional papers.*

23. Supplement to the Fifty-second Annual Report of the Department of Marine and Fisheries for the fiscal year 1918-1919 (Marine)—Steamboat Inspection Report. Presented by Hon. Mr. Ballantyne, March 1, 1920. *Printed for distribution and sessional papers.*

24. Report of the Postmaster General for the year ended March 31, 1919. Presented by Hon. Mr. Rowell, March 2, 1920. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 8.

25. Annual Report of the Department of the Interior, for the fiscal year ended March 31, 1919. Presented by Hon. Mr Meighen, March 10, 1920. *Printed for distribution and sessional papers.*

25*a*. Report of the Topographical Surveys Branch of the Department of the Interior, year 1918-1919. *Printed for distribution and sessional papers.*

25*b*. Sixteenth Report of the Geographic Board of Canada, containing all decisions from April 1, 1917, to March 31, 1919 Presented by Hon. Mr. Meighen, April 28, 1920 *Printed for distribution and sessional papers.*

26. Report of the Geological Survey Branch, Department of Mines, year 1919 *Printed for distribution and sessional papers*

26*a*. Summary Report of the Mines Branch of the Department of Mines, for the year ending December 31, 1919. *Printed for distribution and sessional papers.*

27. Report of the Department of Indian Affairs for the year ended March 31, 1919. Presented by Hon. Mr. Meighen. March 16, 1920. *Printed for distribution and sessional papers*

28. Report of the Royal Northwest Mounted Police for the year ended September 30, 1919. Presented by Hon. Mr Rowell, March 22, 1920 *Printed for distribution and sessional papers.*

29. Report of the Secretary of State of Canada for the year ended March 31, 1919. Presented by Hon. Mr. Sifton, March 10, 1920 *Printed for distribution and sessional papers*

CONTENTS OF VOLUME 9.

(This volume is bound in two parts.)

30. (Sessional Paper No. 18, 6-7 Edward VII, Rev. Ed.) Second Annual Report of the Historical Documents Publication Board, together with accompanying printed volumes, being the second edition, revised and enlarged, of the first volume of the Constitutional Documents relating to Canada 1759-1791, now issued in two parts. Presented by Hon. Mr. Rowell, March 18, 1920. *Printed for distribution and sessional papers.*

CONTENTS OF VOLUME 10.

32. Eleventh Annual Report of the Civil Service Commission of Canada, September 1, 1918–December 31, 1919. Presented by Hon. Mr. Sifton, April 16, 1920 . . . . . *Printed for distribution and sessional papers.*

33. Annual Report of the Department of Public Printing and Stationery for the fiscal year ended March 31, 1919. Presented by Hon. Mr. Sifton, June 8, 1920 . . . . . *Printed for distribution and sessional papers.*

34. Report of the Secretary of State for External Affairs, for the year ended March 31, 1919. Presented by Hon. Mr. Rowell, April 22, 1920 . . . . . *Printed for distribution and sessional papers.*

35. Report of the Minister of Justice as to Penitentiaries for year ending March 31, 1919. *Printed for distribution and sessional papers.*

36. Report of the Militia Council for the Dominion of Canada, for the fiscal year ending March 31, 1919. Presented by Hon. Mr. Guthrie, May 28, 1920 . . . . . *Printed for distribution and sessional papers.*

37. Report of the Department of Labour for the year ended March 31, 1919. The Senate. *Printed for distribution and sessional papers.*

38. Annual Report of the Editorial Committee for the year 1920. Presented 1920. *Printed for distribution and sessional papers.*

39. Report of the Department of the Naval Service, for the fiscal year ending March 31, 1919. Presented by Hon. Mr. Ballantyne, March 1, 1920. . . . . *Printed for distribution and sessional papers.*

40. Fifty-second Annual Report of the Fisheries Branch of the Department of the Naval Service, 1918. Presented by Hon. Mr. Ballantyne, March 11, 1920 . . . . . *Printed for distribution and sessional papers.*

1. Report of the Joint Librarians of Parliament. Presented by Hon. Mr. Speaker, February 26, 1920. . . . . *Not printed.*

42. Copy of the Treaty of Peace between the Allied and Associated Powers and Bulgaria, signed at Neuilly-sur-Seine on the 27th day of November, 1919. Presented by Hon. Mr. Rowell, February 26, 1920. . . . . *Printed for distribution to senators and members.*

42*a*. The Czecho-Slovak Minorities Treaty—Treaty between the Principal Allied and Associated Powers and Czecho Slovakia, signed at Saint-Germain-en-Laye, September 10, 1919. Ratification on behalf of Canada authorized by Order in Council of December 1, 1919. Presented by Hon. Mr. Rowell, March 1, 1920. . . . . *Not printed.*

42*b*. The Serb-Croat-Slovene Minorities Treaty—Treaty between the Principal Allied and Associated Powers and the Serb-Croat-Slovene State, signed at Saint-Germain-en-Laye, September 10, 1919. Ratification on behalf of Canada authorized by Order in Council of December 1, 1919. Presented by Hon. Mr. Rowell, March 1, 1920. . . . . *Not printed.*

42*c*. Arms Traffic Convention—Convention for the control of the trade in arms and ammunition, and Protocol, signed September 10, 1919. Ratification on behalf of Canada authorized by Order in Council of December 9, 1919. Presented by Hon. Mr. Rowell, March 1, 1920 . . . . . *Not printed.*

42*d*. Liquor Traffic Convention—Convention relating to the liquor traffic in Africa, and Protocol, signed at Saint-Germain-en-Laye, September 10, 1919. Ratification on behalf of Canada authorized by Order in Council of December 1919. Presented by Hon. Mr. Rowell, March 1, 1920. . . . . *Not printed.*

42*e*. Berlin and Brussels Acts Convention—Convention revising the General Act of Berlin, February 26, 1885, and the General Act and Declaration of Brussels, July 2, 1890, signed at Saint-Germain-en-Laye, September 10, 1919. Ratification on behalf of Canada authorized by Order in Council of December 9, 1919. Presented by Hon. Mr. Rowell, March 1, 1920 . . . . . *Not printed.*

42*f*. Return to an Address to His Excellency the Administrator, of the 22nd March, 1920, for a copy of the Orders in Council of December 1, 1919, and December 9, 1919, respecting ratification of the treaties and conventions laid before the House of Commons on Monday, March 1, 1920 Presented March 29, 1920, Mr. Fielding *Not printed.*

42*g*. Copy of the English text of the Treaty between the Principal Allied and Associated Powers and Rumania, signed at Paris, December 9, 1919. Presented by Hon. Mr. Rowell, April 14, 1920. . . . . *Not printed.*

42*h*. Copy of the agreement of September 10, 1919, between the Allied and Associated Powers with regard to the contributions to the cost of liberation of the territories of the former Austro-Hungarian monarchy, and copy of Declaration dated the 8th of December, 1919, modifying this Agreement. Presented by Hon. Mr. Rowell, April 21, 1920 . . . . . *Not printed.*

42*i*. Copy of Agreement of September 10, 1919, between the Allied and Associated Powers and Italy with regard to the Italian reparation payments and copy of Declaration of December 8, 1919, modifying this Agreement. Presented by Hon. Mr. Rowell, April 21, 1920 . . . . . *Not printed.*

43. Order in Council, P.C. 69, dated February 28, 1920, Payment of Command Money to Captain Superintendents H.M.C. Dockyards. Presented by Hon. Mr. Ballantyne, March 1, 1920. . . . . *Not printed.*

43*a*. Copy of Order in Council, P.C. 566, dated March 17, 1920: Cancellation of Orders in Council authorizing and governing the payment of Separation Allowance to dependents of Officers and Men in the Canadian Naval Service Presented by Hon Mr. Ballantyne, March 22, 1920 . . . . . *Not printed.*

43*b*. Order in Council, P.C. 559, dated 17th March, 1920: Naval Forces of Canada, including the Naval Volunteer Forces, placed on a peace footing. Presented by Hon. Mr. Ballantyne, March 25, 1920 . . . . . *Not printed.*

43*c*. Copy of Order in Council P.C. 1061, dated 15th May, 1920: Payment of Gratuity to Ratings and Warrant Officers of the Royal Canadian Navy. Presented by Hon. Mr. Ballantyne, May 21, 1920 . . . . . *Not printed*

CONTENTS OF VOLUME 10—*Continued.*

43*d*. Copy of Order in Council, P.C. 1005, dated 20th May, 1920; Engagement of Seamen in Royal Canadian Navy. Presented May 31, 1920. Mr. Hocken . . . . . *Not printed.*

43*e*. Order in Council, No. P.C. 1155, dated May 22, 1920,—Amendments to Rates of Pay for Surgeon Lieutenants, Royal Canadian Navy. (Sessional Papers, 1920, No. .) The Senate . . . . . *Not printed.*

44. Amendments to Radiotelegraph Regulations, Nos. 78, 25 and 104. Presented by Hon. Mr. Ballantyne, March 1, 1920. . . . . *Not printed.*

44*a*. Amendment to Radiotelegraph Regulation No. 92. Presented by Hon. Mr. Ballantyne, March 15, 1920. *Not printed.*

45. Copy of the International Opium Convention, signed at The Hague, January 23, 1912, and ratified January 10, 1920. Presented by Hon. Mr. Rowell, March 2, 1920 . . . . . *Not printed.*

46. Copy of an Agreement between His Majesty the King and the Grand Trunk Railway Company of Canada. Presented by Hon. Mr. Reid, March 2, 1920. . . . . *Not printed.*

47. Copy of Order in Council, P.C. 2596, dated 31st December, 1919—Air Regulations, 1920. Presented by Hon. Mr. Sifton, March 2, 1920 . . . . . *Not printed.*

47*a*. Report of the Air Board, for the fiscal year ending March 31, 1920. Presented by Hon. Mr. Sifton, April 20, 1920. *Not printed.*

47*b*. Copy of Order in Council, P.C. 826, dated 19th April, 1920, respecting the reorganization of the Air Board. Presented by Hon. Mr. Sifton, April 20, 1920 . . . . *Not printed.*

48. Copy of correspondence in respect to the resignation of the Chief Commissioner of the Board of Commerce. Presented by Sir George Foster, March 2, 1920 . . . . . *Not printed.*

48*a*. Copy of correspondence relating to the resignation of Judge Robson as Chairman of the Board of Commerce of Canada. Presented by Sir Robert Borden, June 26, 1920. *Not printed.*

49. Statement supplementary to that of 13th September, 1919, of Superannuation and Retiring Allowances in the Civil Service between the said date and the 31st December, 1919, showing name, rank, salary, service allowance and cause of retirement of each person superannuated or retired, also whether the vacancy has been filled by promotion, or by appointment, and the salary of any new appointee. Presented by Sir Henry Drayton, March 2, 1920. . . . . *Not printed.*

49*a*. Return to an Order of the House of the 22nd March, 1920, for a Return showing the cases in which, from October 1, 1896, to the present, in the computation of superannuation allowances to retiring officials, additional years were allowed under the provisions of Section 12, of Chapter 7, R.S., the dates of the granting of the allowances, the names of the officials and the number of years added to the actual service; along with a copy of all Treasury Board Reports and Orders in Council relating to such cases. Presented March 31, 1920, Mr. Fielding . *Not printed.*

50. Statement in pursuance of Section 17 of the Civil Service Insurance Act, for the year ending March 31, 1919. Presented by Sir Henry Drayton, March 2, 1920. . . . . *Not printed.*

51. Statement of Governor General's Warrants issued since the last Session of Parliament on account of 1919-20. Presented by Sir Henry Drayton, March 2, 1920. . . . *Not printed.*

52. Statement of Expenditure on account of "Miscellaneous Unforeseen Expenses," from the 1st September, 1919, to the 1st March, 1920, in accordance with the Appropriation Act Number (1), 1919. Presented by Sir Henry Drayton, March 20, 1920 . . . . *Not printed.*

53. Statement of Temporary Loans issued by the Government of Canada since the last Session of Parliament still outstanding. Presented by Sir Henry Drayton, March 2, 1920 . . . . *Not printed.*

54. Statement of Receipts and Expenditures of the National Battlefields Commission to 31st March, 1919. Presented by Sir Henry Drayton, March 2, 1920. . . . . *Not printed.*

54*a*. Statement of Receipts and Expenditures of the National Battlefields Commission to 31st March, 1920. Presented by Sir Henry Drayton, April 19, 1920. . . . . *Not printed.*

55. Report of the Ottawa Improvement Commission for the fiscal year ended March 31, 1919. Presented by Sir Henry Drayton, March 2, 1920. . . . . *Not printed.*

56. Statement of the Receipts and Expenditures of the Royal Society of Canada, for the year ended April 30, 1919. Presented by Sir Henry Drayton, March 2, 1920. . . . . *Not printed.*

57. Financial Statement of the affairs of the Montreal Turnpike Trust for the year ended December 31, 1919. Presented by Sir Henry Drayton, March 2, 1920. . . . . *Not printed.*

58. Copy of General Rules and Orders of the Exchequer Court of Canada, in accordance with the provisions of Section 88 of the Exchequer Court Act, Chapter 140, R.S.C. 1906. Presented by Hon. Mr. Sifton, March 10, 1920. *Not printed.*

58*a*. Copy of General Rules and Orders of the Exchequer Court of Canada, in accordance with the provisions of Section 88 of the Exchequer Court Act, Chapter 140, R.S.C. 1906. Presented by Hon. Mr. Sifton, April 14, 1920. *Not printed.*

59. Copy of the Rules of the Supreme Court of Nova Scotia enacted under the provisions of the Controverted Elections Act, Chapter 7, R.S.C. 1906, in accordance with the requirements of Section 85 of the Act. Presented by Hon. Mr. Sifton, March 10, 1920. . . . . *Not printed.*

Copy of the Crown Rules of the Judges of the Supreme Court of Nova Scotia in accordance with the provisions of Section 576, subsection 2, of the Criminal Code. Presented by Hon. Mr. Sifton, April 16, 1920. *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

60. Return showing the number of permits granted to take intoxicants into the Northwest Territories, for the year ending the 31st of December, 1919, in accordance with the provisions of the Revised Statutes, Chapter 62, Section 88. Presented March 10, 1920. . . . . *Not printed.*

61. Report of Admiral of the Fleet, Viscount Jellicoe of Scapa, G.C.B., O.M., G.C.V.O., on Naval Mission to the Dominion of Canada (November-December, 1919). Presented by Hon. Mr. Ballantyne, March 10, 1920.
Printed for distribution to Senators and Members only.

62. Return showing:—1. Number of postmasters in the County of Charlevoix-Montmorency. 2. Their names. 3. Their residence. 4. When they were appointed. 5. Their actual salary. 6. Whether it was ever increased since they were appointed. 7. If not, why. 8. If so, when, and to what extent. Presented March 10, 1920, Mr. Casgrain.
Not printed.

63. Order of the House for a Return showing:—1. Number of mail carriers in the County of Charlevoix-Montmorency 2. Their names. 3. Their residence. 4. When they were appointed. 5. Their actual salary. 6. Whether it was ever increased since they were appointed. 7. If not, why. 8. If so, when, and to what extent. Presented March 10, 1920, Mr. Casgrain . . . . . *Not printed.*

64. Return to an Order of the Senate, dated September 30, 1919, for a statement giving weights and values of the exportation from Canada during the fiscal years of 1916-17-18-19 of mixed fertilizers; also of Sulphate of Ammonia, Nitrate of Soda, Ammoniates, Phosphate Rock, Super Phosphates, Kanite of Potash Salts, Chloride of Potash and Crude Sulphate of Potash, and of any miscellaneous chemicals as are used in the manufacture of artificial fertilizers also Basic Slag from the Provinces of Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, by each province, and where exported to as shown by clearances of the various Custom Houses. The Senate
Not printed.

65. Return to an humble Address of the Senate to His Excellency the Governor General, dated May 8, 1919, showing the date and object of all commissions appointed by the Government since its accession to power in 1911, up to the present date; the number of days during which each of the said commissions sat; the names of the persons composing the said commissions and the cost of each of these commissions to the country. The Senate.
Not printed.

65*a*. Return to an Order of the Senate, dated September 5, 1919, showing:—The number of commissions appointed since 1912, their object, the names of their members and their salaries, the total cost of each commission and those which are still existing. The Senate . . . . . *Not printed.*

65*b*. Return to an Order of the House of the 30th April, 1919, for a Return showing:—1. The number of commissions appointed by the Government since the year 1914, to date, and the purpose for which each was appointed. 2. The number of members on each of said commissions, and their names. Presented March 18, 1920. Mr. Prevost.
Not printed.

65*c*. Return to an Order of the House of the 19th June, 1919, for a Return showing:—1. How many commissions have been appointed by the Governor in Council and by Parliament since the year 1911. 2. The names of the various commissions and the names of the members of the said commissions. 3. The amount of salary and travelling expenses paid to each commission and the sum drawn by each commissioner. Presented March 18, 1920. Mr. Michaud . . . . . *Printed for distribution to Senators and Members only.*

66. Copy of Report of the Royal Commission on Indian Affairs for the Province of British Columbia. Presented by Sir George Foster, March 11, 1920 . . . . . *Not printed.*

67. Report of the Royal Commission appointed to inquire into and concerning the conditions pertaining to running race meets and betting in connection therewith, in Canada. Also copy of the evidence taken before the Royal Commission appointed to inquire into and concerning the conditions pertaining to running race meets and betting in connection therewith, in Canada. Presented by Sir George Foster, March 16, 1920.
Printed for Members and Senators only.

68. Return to an Address to His Excellency the Governor General of the 19th March, 1919, for a copy of the Order in Council appointing the Board of Grain Supervisors for Canada. Presented March 12, 1920. Mr. Stevens.
Not printed.

69. Detailed Statement of Bonds or Securities registered in the Department of the Secretary of State since February 26, 1919. The Senate . . . . . *Not printed.*

70. Return to an Order of the House showing:—1. How many Acting Ministers have been named or appointed since December 17, 1917. 2. Their names and in what Department they have administered as Acting Minister. 3. On what date each Minister was so appointed. Presented March 15, 1920. Mr. Tobin. . *Not printed.*

71. Copy of correspondence relating to the resignation of Hon. A. K. Maclean, and Hon. S. C. Mewburn, Minister of Militia and Defence, as Members of the Government of Canada. Presented by Sir George Foster, March 15, 1920.
Not printed.

72. "The Forest Reserves and Parks Act." Presented by Hon. Mr. Meighen, March 16, 1920 *Not printed.*

73. Return of Orders in Council which have been published in the *Canada Gazette* and in the British Columbia *Gazette*, between 1st August, 1919, and the 5th February, 1920, in accordance with provisions of Sub-section (d) of Section 38 of the regulations for the survey, administration, disposal and management of Dominion Lands within the 40-mile Railway Belt in the Province of British Columbia. Presented by Hon. Mr. Meighen, March 16, 1920.
Not printed.

74. Return of Orders in Council which have been published in the *Canada Gazette*, between the 1st August, 1919, and the 5th February, 1920, in accordance with the provisions of Section 5 of "The Dominion Lands Survey Act," Chapter 21, 7-8 Edward VII. Presented by Hon. Mr. Meighen, March 16, 1920 . . . . . *Not printed.*

75. Return to Orders in Council which have been published in the *Canada Gazette*, between 1st August, 1919, and the 5th February, 1920, in accordance with the provisions of Section 77 of "The Dominion Lands Act," Chapter 20, 7-8 Edward VII. Presented by Hon. Mr. Meighen, March 16, 1920 *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

76. Copy of Order in Council, P.C. 198, dated 29th day of January, 1920—Defining the standard of Canadian silver coinage. Presented by Sir Henry Drayton, March 16, 1920. . . . . *Not printed.*

77. Return to an Order of the House of the 8th October, 1919, for a copy of the correspondence exchanged between the firm of Becker and Company, Ltd., London, England, and the High Commissioner of Canada in London, concerning a certain circular issued by the Canadian Mission. Presented by Sir George Foster, March 17, 1920. *Not printed.*

78. Copies of Orders in Council, P.C. 1445, dated 17th July, 1919; P.C. 1955, dated 18th September, 1919; and P.C. 2562, dated 24th December, 1919, together with copy of letter addressed to the Chairman of the Canadian Section of the International Joint Commission, dated 21st January, 1920, relating to the development and use of the waters of the St. Lawrence river forming the boundaries between the United States and Canada. Presented by Hon. Mr. Rowell, March 18, 1920 . . . . . *Not printed.*

79. Return to an Order of the House of the 12th May, 1919, for a copy of all reports, letters, memoranda, telegrams, plans and estimates in connection with the construction of a bridge over the river Batiscan, in the parish of St. François-Xavier de Batiscan, Champlain County. Presented March 18, 1920. Mr. Deslauriers. . . . . *Not printed.*

79a. Return to an Order of the House of the 12th April, 1920, for a copy of all reports, letters, memos, correspondence, plans and specifications relative to the construction of a bridge on the Batiscan river, in the parish of St. François-Xavier of Batiscan, in the County of Champlain. Presented by Hon. Mr. Reid, April 26, 1920. . . *Not printed.*

80. Return to an Order of the House of the 29th September, 1919, for a copy of all letters, plans and contracts between the Government or the Commission of the Transcontinental and the Canadian Pacific Railway Company, concerning (*a*) the construction, by this Company, of a railway station at "The Palais" in the City of Quebec; (*b*) the conditions of exploitations of the said station by the Transcontinental Railway Company or by the National Railways, and also any Orders in Council in this connection. Presented March 18, 1920. Mr. *Not printed.*

81. Return to an Order of the House of the 29th September, 1919, for a copy of all correspondence and other papers and documents in the possession of the Government or of the Civil Service Commission relating to the appointment of a Harbour Master for the Port of Canso, N.S. Presented March 18, 1920. Mr. Sinclair (Antigonish). *Not printed.*

82. Return to an Order of the House of the 29th September, 1919, for a copy of all correspondence relating to the dismissal of James Conner from the dual positions which he held at Snowflake, Manitoba, under the Department of Customs, and Immigration and Colonization. Presented March 18, 1920. Mr. Richardson . . . *Not printed.*

83. Detailed Statement of Remissions of Customs Duties and the Refund thereof, under Section 92, Consolidated Revenue and Audit Act, through the Department of Customs, for the fiscal year ended 31st March, 1918. Presented by Hon. Mr. Sifton March 18, 1920. . . . . *Not printed.*

84. Return to an Order of the House of the 29th September, 1919, for a copy of all documents, letters and plans, exchanged between the Government and any person, commission or company concerning the construction, in the City of Quebec, or in the suburbs, of a tunnel to facilitate the entrance of the Transcontinental or of any other company in the said city. Presented March 18, 1920. Mr. Parent. . . . . *Not printed.*

85. Return to an Order of the House of the 22nd September, 1919, for a Return showing the total number of persons of both sexes now employed by the Federal Government of the Dominion of Canada. Presented March 18, 1920. Mr. Tobin . . . . . *Not printed.*

86. Return to an Order of the House of the 10th March, 1920, for a copy of the contract between the Government of Canada or the Canadian Wheat Board and Greece, for 12,000,000 bushels of wheat. Presented March 18, 1920. Mr. Archambault. . . *Not printed.*

87. Return to an Order of the House of the 10th November, 1919, for a copy of all correspondence, telegrams and other documents exchanged between the Federal Government and the Government of New Brunswick with regard to the transfer of wharves on the St. John river and tributary waters, including a copy of all correspondence regarding the liability of the Dominion Government in maintaining and repairing these wharves. And Return to an Order of the House of the 10th November, 1919, for a copy of all reports and recommendations made by the officers of the Department of Public Works during the years 1918-1919, on the condition of the wharves in the St John river and tributary waters, and the repairs required thereto. Presented March 18, 1920. Mr. McLean (Royal) . . . . . *Not printed.*

88. Return to an Order of the House of the 29th September, 1919, for a copy of all documents, letters and plans passed between the Government and the City of Quebec or any other corporation or construction and transport company or any other person, concerning the construction or the non-construction of a dam on the St Charles river, in the City of Quebec. Presented March 18, 1920. Mr. Parent. *Not printed.*

89. Return to an Order of the House of the 10th March, 1920, for a Return showing the total amount of Canadian securities previously held in Great Britain, and sold to the United States, with the amount of interest now payable by this Dominion to the United States to replace amount formerly paid to Great Britain. Also a copy of all correspondence relating to this matter. Presented March 18, 1920. Mr. Devlin . . . *Not printed.*

90. Return to an Order of the House of the 11th March, 1920, for a copy of all correspondence, agreements and contracts, between the Government and any banks touching the payment of officers and men in the Canadian Expeditionary Forces, especially as regards the rates of exchange prevailing between Canadian and British currency and the manner in which the same affected the pay of said officers and men, together with copies of all departmental or other Government orders or regulations dealing with the subject of soldiers' pay and the effect of fluctuations of exchange thereon. Presented March 22, 1920. Mr. McMaster . . . . . *Not printed.*

91. Return to an Order of the House of the 11th March, 1920, for a Return showing:—1. The number of officers being retained in the service of the Militia Department at Headquarters at Ottawa who have not seen service overseas. 2. Their names, positions, salaries and length of time in the service, respectively. 3. Whether returned men are available for those positions. Presented March 22, 1920. Mr. McKenzie. *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

91*a*. Return to an Order of the House of the 29th March, 1920, for a Return giving a list of the names of all the officers employed at the Headquarters of the Militia Department, at Ottawa, their respective salaries the date of their appointment and the length of their services in the Canadian Expeditionary Force. Presented June 8, 1920. Mr. Archambault ..... *Not printed.*

92. Return showing:—1. Names of the tenderers for the works to be done at the following places in the County of Montmorency, Quebec: Ste. Anne de Beaupre, Ste. Famille-Ile d'Orleans, St. François du Sud-Ile d'Orleans, St. Jean-Isle d'Orleans, Ile de la Quarantine, Pointe aux Trembles. 2. Where they reside. 3. Amount of each tender. 4. Who the successful tenderers were. 5. Whether the said works have been started. 6. When they will be completed. Presented March 22, 1920. Mr. Casgrain. *Not printed.*

93. Orders in Council relating to the organization and work of the Department of Health, as follows:—1. Order in Council, P.C. 1627, dated August 2, 1919, naming the President of the Privy Council as the Minister of the Crown to preside over the Department of Health and providing for the transfer to the Department of Health from the Department of Immigration and Colonization of the staff of the Quarantine and Medical Service. 2. Order in Council, P.C. 1765, dated August 23, 1919, transferring to the Department of Health from the Department of Trade and Commerce the administration of the Adulteration Act, the Proprietary or Patent Medicine Act, the Commercial Feeding Stuffs Act and the Fertilizers Act. 3. Order in Council, P.C. 2204, dated October 30, 1919, transferring to the Department of Health the work of the Housing Committee of the Cabinet. 4. Order in Council, P.C. 2321, dated November 21, 1919, transferring to the Department of Health from the Department of Marine and Fisheries, the administration of Marine Hospitals. 5. Order in Council, P.C. 2612, dated December 31, 1919, transferring to the Department of Health the Medical Branch of the Commission of Conservation. Presented by Hon. Mr. Rowell, March 24, 1920 *Not printed.*

93*a*. Order in Council, P.C. 1961, dated September 29, 1919, covering the appointment of an Advisory Board as prescribed in the "Act to amend the Proprietary or Patent Medicine Act." Chapter 66, 9-10 George V. Order in Council, P.C. 2079, dated October 8, 1919, covering the appointment of the Dominion Council of Health. Order in Council, P.C. 328, dated February 11, 1920, accepting the resignation of the Hon. Walter R. Rollo as a Member of the Dominion Council of Health and appointing Mr. H. J. Hnlford, of Hamilton, Ontario, Vice-President of the Trades and Labour Congress of Canada, in Mr. Rollo's place. Presented by Hon. Mr. Rowell, March 25, 1920. *Not printed.*

94 Copies of General Orders promulgated to the Militia for the period between February 1, 1919, and February 2, 1920. Also,—Copies of all Routine Orders of the Canadian Expeditionary Force promulgated from February 22, 1919, to February 24, 1920. Presented by Hon. Mr. Guthrie, March 24, 1920 *Not printed.*

95. Appointments, Promotions and Retirements, Canadian Militia and Canadian Expeditionary Force, from February 6, 1919, to January 22, 1920. Presented by Hon. Mr. Guthrie, March 24, 1920. *Not printed.*

96. Return to an Order of the House of the 18th September, 1919, for a Return showing:—1. The total number of men who joined the Expeditionary Force for service in Siberia. 2. How many of such number voluntarily enlisted for service in Siberia. 3. Whether the Government is aware as to whether or not a considerable number of members of such Expeditionary Force were made to embark at Victoria, B.C., by compulsion and with the point of the bayonet directed at them. 4. Whether the Government is aware as to whether or not certain members of such Expeditionary Force who had not voluntarily enlisted for service in Siberia were court-martialed and sentenced to hard labour. If so, who such members are and what the nature of the sentence was. 5. The cost to the Government of the Expeditionary Force for service in Siberia. Presented March 25, 1920. Mr. Archambault *Not printed.*

96*a*. Return to an Order of the House of the 7th April, 1920, for a copy of all correspondence, documents, and records including the evidence and judgments in connection with the trials held by Field General Court Martial of the 259th, of the Canadian Expeditionary Force in Siberia, on the following Riflemen, sentenced on the 28th of January, 1919: Alfred Laplante, O. Boisvert, Edmond Leroux, Joseph Guenard, E. Pauze and Arthur Roy. Presented May 18, 1920. Mr. Archaumbault. *Not printed.*

97. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Whether any work has been done on any of the lines enumerated in the Second Schedule of Chap. 13, 9-10, George V, being an Act to incorporate the Canadian National Railway Company and respecting Canadian National Railways 2. If so, on what particular line the work has been done. 3. What kind of work has been done. 4. How much money has been expended for this work. 5. How much in construction. In surveys. In expropriation, and the purchase of the Right of Way. 6. How many station sites have been located on said lines, what the name is of each station, and on what particular line. 7. Description of the land upon which it is located. How much was paid for said station site, and who was representing the Government or the Canadian National Railways in negotiating the purchase. 8. If moneys were paid for any of such sites, to what appropriation they were charged, and on whose order they were paid. 9. Whether any Order in Council has been passed entrusting said company with the management and operation of the Grand Trunk Pacific and the Intercolonial Railways. Presented March 25, 1920. Mr. Bureau *Not printed.*

98. Return to an Order of the House of the 18th March, 1920, for a copy of all representations, complaints and other correspondence filed with the Civil Service Commission regarding Classification of the Civil Service of Canada. Presented March 26, 1920. Mr. Fripp ... *Not printed.*

98*a*. Return to an Order of the House of the 12th April, 1920 for a Return showing:—1. Number of classification engineers employed in connection with the Civil Service. 2. Total amount paid to classification engineers to date in connection with the work of classifying the Civil Service. 3. Further estimate required to complete the work. Presented April 29, 1920. Mr. Sinclair (Antigonish.) *Not printed.*

99. Return to an Order of the House of the 10th March, 1920, for a copy of all correspondence relating to the appointment of the Postmaster at Metabetchouan, Quebec. Presented March 29, 1920. Mr. Savard *Not printed.*

100. Draft Conventions and Recommendations adopted by the International Labour Conference at Washington and communicated to the Government by the Secretary-General of the League of Nations pursuant to Article 405, Treaty of Versailles:—1. Draft Convention limiting the hours of work in industrial undertakings to eight in the day and forty-eight in the week. 2. Draft Convention concerning unemployment. 3. Recommendation concerning unemployment. 4. Recommendation concerning reciprocity of treatment of foreign workers. 5. Draft Convention concerning the employment of women before and after childbirth. 6. Draft Convention concerning the employment of women during the night. 7. Recommendation concerning the prevention of anthrax. 8. Recom-

CONTENTS OF VOLUME 10—*Continued.*

mendation concerning the protection of women and children against lead poisoning. 9. Recommendation concerning the establishment of Government Health Services. 10. Draft Convention fixing the minimum age for admission of children to industrial employment. 11. Draft Convention concerning the night work of young persons employed in industry. 12. Recommendation concerning the application of the Berne Convention of 1906, on the prohibition of the use of white phosphorus in the manufacture of matches. Presented by Hon. Mr. Rowell, March 29, 1920 . . . . . *Not printed.*

100*a*. Return showing:—1. Names of the Canadian representatives at the International Labour Conference last fall. 2. Amount expended in connection with this delegation. 3. Names of Canadian representatives at the Labour Conference at Paris. 4. Amount expended in relation thereto. Presented March 29, 1920. Mr. Archambault *Not printed.*

101. Return to an Order of the House of the 18th March, 1920, for a Return showing:—1. On what date a Branch of the Public Works Department was first established at Antigonish, N.S. 2. What counties in Nova Scotia were originally under the jurisdiction of the Antigonish Branch. 3. When the North Sydney office was established. 4. Names of the employees in the Antigonish Branch prior to the change and the amount of their yearly salaries. 5. Names of the employees in both offices on December 31, 1914, and their yearly salaries. 6. Names of the present employees in both branches and their respective yearly salaries. 7. How much was expended in public works in the area under the jurisdiction of the Antigonish Branch for five years prior to December 31, 1911. 8. How much was expended in public works in the area covered by both the Antigonish and North Sydney Branches during the five years subsequent to January 1, 1912. Presented March 29, 1920. Mr. Sinclair (Antigonish) . . . . . *Not printed.*

101*a*. Return showing the details of the expenditure of $1,372,079 82 made in the area covered by both the Antigonish and North Sydney Branches of the Department of Public Works during the five years subsequent to January 1, 1912. Presented April 7, 1920. Mr. Sinclair (Antigonish.) . . . . . *Not printed.*

102. Return to an Order of the House of the 22nd of March, 1920, for a copy of all correspondence relating to the public cross-road between Ste.-Catherine and Tadoussac. Presented March 29, 1920. Mr. Savard.. . . . . *Not printed.*

103. Return to an Order of the House of the 29th March, 1920, for a Return showing:—(*a*) the total production of coal in Canada during the past ten years (*b*) how much of said coal was anthracite (*c*) the total importation of coal into Canada during the same period (*d*) how much of same was anthracite (*e*) the total exportation of coal from Canada during the past ten years and (*f*) how much of this total was anthracite. Presented March 31, 1920. Mr. Archambault . . . . . *Not printed.*

104. Return to an Order of the House of the 10th March, 1920, for a Return showing:—1. What amount of money has been expended by the Government during the years 1918-19-20 in providing seed grain for settlers in the Lethbridge and Calgary land districts respectively. 2. What amount of money has been expended by the Government as its share of the freight charges in providing feed for live stock in Southern Alberta in the years 1918-19-20. Presented April 6, 1920. Mr. Buchanan. . . . . *Not printed.*

105. Return to an Order of the House of the 15th March, 1920, for a Return showing for each of the fiscal years 1891, 1896, 1901, 1906, 1911, 1914, 1915, 1916, 1917, 1918, 1919 and estimated 1920 (*a*) Total revenue of the Dominion (*b*) Expenditure chargeable to Consolidated Fund (*c*) Expenditure chargeable to capital (*d*) Total expenditure (*e*) Estimated population (*f*) Total revenue per head of population (*g*) Expenditure per head chargeable to Consolidated Fund, and (*h*) Total expenditure per head. Presented March 6, 1920. Mr. Fielding . . . . . *Not printed.*

106. Return to an Order of the House of the 22nd March, 1920, for a Return showing:—1. The total amount of the gross consolidated debt of Canada on the 28th of February, 1920. 2. Total amount of the net consolidated debt of Canada on the same date. 3. Total amount of the assets of the consolidated debt of Canada on the said date. 4. Total amount of the yearly interest payable on the gross consolidated debt of Canada on the said date. 5. Total amount of yearly interest or revenue received or collected by Canada in respect to the property or securities constituting the assets of the public debt. 6. Total amount of the floating debt of Canada on the 28th of February, 1920. 7. Total amount of yearly interest payable on the floating debt of Canada on the said date. Presented April 6, 1920. Mr. Parent. . . . . *Not printed.*

107. Return to an Order of the House of the 24th March, 1920, for a copy of the correspondence between the Minister of Lands and Forests of the Province of Quebec and the Soldiers' Settlement Board. Presented April 6, 1920. Mr. Gauvreau . . . . . *Not printed.*

108. Return showing:—1. What loans have been negotiated by the Dominion Government since 1911. 2. The distinctive name of each loan and its amount. 3. Of the said loans, which were (*a*) foreign, (*b*) British, and (*c*) Canadian. Presented April 7, 1920. Mr. Casgrain . . . . . *Not printed.*

109. Return to an Order of the House of the 19th March, 1919, for a return showing the total cost and general expense of the 1918 Victory Loan, including detailed statements of the amounts paid to brokers, banks, newspapers, advertising agencies, and all other persons, corporations, firms and agencies to whom payments were made, giving the names of such persons, banks, newspapers, agencies or firms in each case. Presented April 7, 1920. Mr. Blake . . . . . *Not printed.*

110. Report of the Explosives Division of the Department of Mines for the year 1919. The Senate *Not printed.*

111. Return to an Order of the House of the 22nd March, 1920, for a Return showing the number of persons or corporations paying and the aggregate amount paid by each group by way of Dominion Income Tax in the City of Toronto during the fiscal years 1917 and 1918 whose assessed income was over $1,500, $6,000, $10,000, $20,000, $30,000, $50,000, $100,000. Presented April 12, 1920. Mr. Kennedy. . . . . *Not printed.*

112. Return showing:—1. Number of post offices on the north shore of the St. Lawrence from Tadoussac to Esquimaux Point. 2. Names, postal addresses and the date of appointment of each of these postmasters. Presented April 12, 1920. Mr. Savard . . . . . *Not printed.*

113. Return to an Order of the House of the 25th March, 1920, for a Return showing how many houses have been commenced, and how many finished, under the legislation of a year ago. Presented April 13, 1920. Mr. Clark (Red Deer) . . . . . *Not printed.*

114. Copy of Resolutions of thanks passed by the British House of Commons to the Forces engaged in the late War, and embodying thanks to the troops from the Dominions overseas for their services during the said war. Presented by Hon. Mr. Rowell, April 13, 1920 . . . . . *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

115. Return to an Order of the House of the 31st March, 1920, for a copy of all correspondence, Orders in Council, reports and all other documents respecting the apportionment of expenses on the League of Nations and the payment of the sum of $64,043 15 on February 13th, 1920, as Canada's share of such expense. Presented April 13, 1920. Mr. Fielding . *Not printed.*

116. Return to an Order of the House of the 15th March, 1920, for a copy of all papers, documents, telegrams, correspondence and reports made between the Department of Naval Service and the Inspector of Fisheries in Prince Edward Island or any other party or parties regarding the sale of the lobster hatchery at Charlottetown, P E I. Presented April 15, 1920. Mr. Sinclair (P.E.I.) *Not printed.*

117. Return to an Order of the House of the 19th March, 1919, for a Return showing:—1. The number of vessels belonging to the Canadian Government in the Canadian Naval Service during the war. 2. Their names. 3. The number of vessels employed in the work of the Canadian Naval Service rented or chartered during the period of the war. 4. Their names. Presented April 15, 1920. Mr. Deslauriers *Not printed.*

118. Return to an Order of the House of the 24th March, 1919, for a Return showing the number of commutation of sentence accorded by the Department of Justice to prisoners condemned to be hanged, where the crimes were committed, and the sentence imposed after commutation, within the last four years. Presented April 15, 1920. Mr. Cosgrave. *Not printed.*

119. Return to an Order of the House of the 10th March, 1920, for a Return showing:—1. Number of persons discharged from the Government Printing Bureau and Department of Public Printing and Stationery from 1st January, 1919, to 1st March, 1920. 2. Upon whose recommendation and report dismissals were made. 3. Whether the King's Printer or Assistant King's Printer recommended the persons to be dismissed. 4. Whether the report of dismissal was in writing. 5. What qualifications the person or persons had who investigated the respective cases for dismissal, what investigation was made by them and whether their conclusions are reduced to writing. Presented April 15, 1920. Mr. Fripp. *Not printed.*

120. Return to an Order of the House of the 24th March, 1920, for a copy of all letters, telegrams, correspondence, and other papers in the possession of the Government, in connection with the transfer of mail bags from the C.P.R. mail car to the mail car of the Quebec, Montreal and Southern Railway Company, and from the latter to the former, at Iberville Junction, during the period extending from the month of November, 1917, to the month of April, 1918. Presented April 16, 1920. Mr. Demers *Not printed.*

121. Return to an Order of the House of the 31st March, 1920, for a copy of all telegrams, papers, letters and correspondence with reference to the application for naturalization of Professor F. V. Riethdorf, alias Frederick Edwards, 205 Scott Block, Winnipeg, also for copies of all correspondence to date with reference to the resignation of the said F. V. Riethdorf, alias Frederick Edwards, from the employ of the Department of State and in particular correspondence with the President of the Privy Council, Controller McLean and Mr. A. Brophy of the said Department. Presented April 16, 1920. Mr. Power *Not printed.*

122. Return to an Order of the House of the 22nd March, 1920, for a Return showing:—1. Number of chartered banks in Canada in 1880. 2. Number of chartered banks in Canada at the present time. 3. What profits, as shown by their annual statements, were made by each of the chartered banks in the years 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918 and 1919. 4. What taxes each paid to the Federal Treasury in each of the above years. 5. What amount, not being interest on money borrowed, the Federal Government paid to each chartered bank in each of the years 1914, 1915, 1916, 1917, 1918 and 1919 for service rendered. 6. The paid up capital of each bank, and its reserve. Presented April 16, 1920. Mr. Ross. *Not printed.*

123. Copy of all correspondence, papers, documents and telegrams, concerning the amelioration of conditions among the Indians and Eskimos inhabiting the east coast of James and Hudson Bays, from East Main River in the south to Hudson Straits in the north, showing what has been and is being done to provide emergency relief, medical attention, administration of Justice, industrial training, introduction of reindeer treaty rights, securing of adequate prices for their furs, and any other matter in the interests of these people. The Senate *Not printed.*

124. Return to an Order of the House of the 15th April, 1920, for a Return showing:—1. What the value in Canadian currency of the British pound sterling was on the first of the months of November and December, 1913, on the first of all the months of the years 1915, 1916, 1917, 1918, and on the first of January and February, 1919. 2. During the years 1914, 1915, 1916, 1917 and 1918, whether the officers and men of the Canadian Expeditionary Force were paid in accordance with the rates of exchange prevailing at the various times at which payments were made to them, and if not, at what rate or rates. 3. What was done in this respect with payments made to interned Canadian soldiers, and at what rate or rates their pay was converted into the currencies of the countries in which they were interned. Presented April 19, 1920. Mr. McMaster *Not printed.*

125. Return to an Order of the House of the 12th April, 1920, for a Return showing:—1. How much, if any, of the Federal Emergency Fund for the re-establishment of the returned soldier was overpaid or inadvertently paid to those not entitled to it under the regulations. 2. How much of this amount has been recovered. 3. How many prosecutions have been instituted for this recovery. 4. What the decision has been in each case. 5. Whether it is the intention of the Government to undertake any further action in cases of this nature. Presented April 19, 1920. Mr. Chisholm *Not printed.*

126. Return to an Order of the House of the 12th May, 1919, for a Return showing:—1. Whether prosecutions were authorized by the Government against parties in the Province of Nova Scotia for neglecting to place War Revenue Stamps upon packages of Proprietary or Patent Medicine before the sale thereof, as required by the War Revenue Act, 1915. 2. Person or persons appointed to institute these prosecutions. 3. Number of prosecutions, if any brought. 4. Names of solicitors designated by the Government to conduct them. 5. Terms of said solicitors' appointment. 6. Gross amount of fines imposed. 7. In what counties in Nova Scotia such prosecutions were brought. 8. Who recommended the appointment of such Prosecutors and Solicitors. Presented April 19, 1920. Mr. Sinclair (Antigonish). *Not printed.*

127. Copy of Order in Council P.C. 395, dated 18th February, 1920, in respect to the organization of an Air Force in Canada. Presented by Hon. Mr. Sifton, April 19, 1920 *Not printed.*

128. Return showing:—1. For what purposes the special Trade Commission of the overseas branch of the Department of Trade and Commerce has been created, and how the purposes are to be accomplished. 2. Who is in charge thereof, and his salary. 3. If publicity for Canadian production is sought, who has received the appointment

CONTENTS OF VOLUME 10—*Continued.*

of publicity expert, and what the proposed remuneration is for such. 4. What sums, annually or otherwise, are paid by Canada to the British newspaper known as *Canada*, and what sums to the *Canada Gazette*? Presented April 19, 1920. Mr. McMaster . . *Not printed.*

129. Return to an Order of the House of the 7th April, 1919, for a copy of the correspondence exchanged between F. X. Gagnon, Port Daniel East, Quebec, and the Department of Justice, regarding the Military Exemption Tribunal which sat at that place. Presented April 20, 1920. Mr. Marcil (Bonaventure). . . . *Not printed.*

130. Return to an Order of the House of the 29th September, 1919, for a copy of all telegrams, letters, contracts and plans, passed between the Commission of the Transcontinental Railway, or the Government and the City of Quebec, the different transport companies, the Harbour Commission of Quebec or any other persons, corporations or companies from 1910 to date, concerning the construction of a railway station at the Champlain Market in the city of Quebec, also the construction, in the said city, of wharves, docks, elevators to facilitate the transport of grain from the West via the Port of Quebec. Presented April 20, 1920. Mr. Parent . . . *Not printed.*

130a. Return to an Order of the House of the 5th May, 1920, for a copy of all documents, contracts and correspondence relating to the negotiations between the City of Quebec and the Transcontinental Railway regarding the Champlain market site and the proposed docks and grain elevators situated along the front of the St. Lawrence river, Quebec. Presented May 18, 1920. Mr. Power . . . *Not printed.*

131. Return to an Order of the House of the 29th September, 1919, for a copy of all documents, letters, and plans, submitted by the Harbour Commission of Quebec since 1910 to date, concerning the construction of wharves, docks elevators, cold storage, terminal facilities in the Port of Quebec, for the transport by land and water. Presented April 21, 1920. Mr. Parent . . . . . *Not printed.*

132. Return showing:—1. Minimum and maximum salary being paid to postmasters. 2. By what method the minimum and maximum salary of postmasters is determined. 3. Whether postmasters receive a bonus on account of the high cost of living. 4. If not, why. 5. Minimum and maximum salary being paid to rural mail carriers. 6. Whether the Government has fixed a maximum rate per mile to apply to rural mail routes. 7. How the salary of rural mail carriers is determined. 8. Whether rural mail carriers receive a bonus on account of the high cost of living. 9. If not, why. 10. Minimum and maximum salary being paid to letter carriers. 11. Whether letter carriers receive a bonus. 12. If so, how much. Presented April 21, 1920. Mr. Keanedy (Glengarry.) *Not printed.*

133. Return showing:—1. Number of persons employed in the province of Quebec in connection with the work of the Soldiers' Settlement Board. 2. Their names and post office addresses. 3. Salary or remuneration each one is drawing. 4. Whether any of these employees are allotted to certain constituencies. 5. If so, what persons are allotted to the various constituencies, and to what constituencies. Presented April 26, 1920. Mr. Tobin. *Not printed.*

134. Return to an Order of the House of the 31st March, 1920, for a copy of all letters, telegrams and other correspondence that has passed between one George Carvill, of the City of St. John, formerly City Ticket Agent for the Canadian Government Railway (formerly Intercolonial Railway) at the said City of St. John, and any and all others for and on behalf of the said George Carvill and the Minister of Railways and Canals, Deputy Minister or any other Ministers of the Government or any general manager, assistant manager, superintendent or other officials of the Canadian Government Railway in reference to the dismissal of the said George Carvill from said railway on the 30th day of April, A.D. 1917, and the request of the said George Carvill for an investigation under oath before an independent tribunal into the causes for his dismissal and the refusal of the management of the said railway to grant such an investigation. Presented April 27, 1920. Mr. Copp . . . . *Not printed.*

135. Return to an Order of the House of the 22nd March, 1920, for a copy of all documents, letters, telegrams and other correspondence in the hands of the Government concerning the proposed railway between St. Camille, County of Bellechasse, and Cabano, County of Temiscouata. Presented April 27, 1920. Mr. Falard . . . *Not printed.*

136. Return to an Order of the House of the 22nd March, 1920, for a copy of the Report made by the Board of Railway Commissioners for Canada, on the application of the Canadian Pacific and Grand Trunk Railway Companies, on behalf of themselves and other railways carrying His Majesty's mail in Canada, asking that fair and reasonable rates be fixed by the Board for the carriage of mails pursuant to the reference of the matter to the Board by Order in Council, P.C., 617, dated March 7, 1917, for the determination as to the accuracy or inaccuracy of the claim made by the railway companies, that these rates are inadequate, and, if it is found that the present rates are inadequate to determine as the result of evidence to be submitted by the Post Office Department and the railway companies interested what would be a fair rate of payment for the service. Also a copy of all correspondence between members of the Government or any officials thereof and the Board of Railway Commissioners or any officials thereof in reference to the report mentioned above. Presented April 27, 1920. Mr. Bureau. *Not printed.*

136a. Return to an Order of the Senate dated April 28, 1920, for a Return of the evidence and other proceedings submitted before the Dominion Railway Commission at the sessions at Ottawa on October 3, 1911, November 7, 1911, and March 18, 1919, relating to freight rates and all matters before said Board on said rates. 2. A copy of the report made by said Board to the Government as the result of said investigations. 3. A copy of the postal rate agreement or agreements existing between the Government and the railway companies for parcel post service, including a statement or copy of the rates charged by the Government railways. 4. A copy of the report made by the Dominion Railway Board to the Government on the contracts between the Government and the railway companies as to the rates charged for the postal services. 5. Does the said report show (or is the Government aware) that the rates fixed and paid are less than it cost the railway companies to perform the services. 6. What quantity of mail is carried annually by parcel post. 7. How much of it is carried for mail order houses—distinguishing quantities by provinces. 8. What are the postal rates charged for parcel post packages: (*a*) to the public (*b*) to mail order houses. 9. Do these rates pay the full cost of transportation. If not, what is the loss. 10. If there is a loss how is it provided for? 11. Does the Government intend to make a change in the parcel post rates. If so, what. The Senate.. *Not printed.*

137. Return to an Order of the House of the 12th April, 1920, for a Return showing at the end of the fiscal year 1910, and each subsequent year, the total assets of Canada, the amount received in each year as interest or other income from such assets, and the average rate of interest or other income so received in each year. Presented April 28, 1920. Mr. Fielding . . . . . *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

138. Return to an Order of the House of the 10th March, 1920, for a Return showing:—1. The total amount of commission charges paid to brokers and agents in connection with the last Victory Loan. 2. What amounts have been paid to each of the said brokers and agents. 3. Whether any of the said commission charges have not yet been paid. 4. If so, whose accounts they are, and for what reason they have not been paid. Presented April 28, 1920 Mr. Archambault . . . . . *Not printed.*

139. Return showing:—1. Names of the so-called experts employed by the Arthur Young Company to classify the employees of the various departments, and which department or departments did each such expert classify. 2. The ages, nationality educational, and practical qualification, including positions previously held, with special reference to classification work, of each such expert. 3. (*a*) Cost to the Government for the services of each such expert; (*b*) what is the cost to the Arthur Young Company of the services of each expert. Have they been paid in Canadian or American money. 4. How many Deputy Ministers have approved the classification of their departments. 5. Whether the Arthur Young Company pay an income or business tax in Canada. 6. In case of difference of opinion respecting classification between the so-called experts and the Civil Service Commission whose opinion prevails. Presented April 28, 1920. M. Gauvreau . . . . . *Not printed.*

140. Return to an Order of the House of the 14th April, 1920, for a copy of all reports, letters, petitions or documents referring to claims for damages on behalf of innocent victims who, during the so-called Quebec riots of 1918, have either been killed or wounded by the soldiers of His Majesty. Presented April 29, 1920. Mr. Parent. *Not printed.*

141. Return to an Order of the Senate dated April 18, 1918, for a Return showing:—The amount paid in each year since 1900 inclusive, for (*a*) reporting, (*b*) translating, (*c*) typewriting, and (*d*) printing proceedings before Commission of Inquiry and all other investigations for or on behalf of the Government or any Department thereof, in English and in French respectively, the names of the persons under (*a*), (*b*) and (*c*) to whom such payments were made, the amount paid to each as salary or other compensation, and the amount paid on account of each such person for travelling and living expenses. The Senate . . . . . *Not printed.*

142. Return to an Order of the Senate, dated April 16, 1918, for a Return referring to Return of the Senate (No. 7, August 23, 1917, *re* officers 78th Regiment, Highlanders of Pictou County, Nova Scotia):—1. (*a*) Giving the names of the officers mentioned in the said Return who served with the overseas forces at the fighting front since said Return was compiled. (*b*) The unit and date each one so served. (*c*) The number who became casualties, and when. 2. The location, connection and rank of each of the officers mentioned in said Return in the overseas forces at the present time. The Senate . . . . . *Not printed.*

142a. Supplementary Return to an Order of the Senate dated April 16, 1918, for a Return referring to Return of the Senate (No. 7, August 23, 1917, *re* officers 78th Regiment, Highlanders of Pictou County, Nova Scotia):—1. (*a*) Giving the names of the officers mentioned in the said Return who served with the overseas forces at the fighting front since said Return was compiled. (*b*) The unit and date each one so served. (*c*) The number who became casualties, and when. 2. The location, connection and rank of each of the officers mentioned in said Return in the overseas forces at the present time. The Senate . . . . . *Not printed.*

143. Copy Declaration by the Supreme Council of the Peace Conference on the Economic Conditions of the World. The Senate . . . . . *Not printed.*

144. Return showing:—1. Whether the Government pays the expenses of an office in Toronto for A. V. White, consulting engineer of the Conservation Commission. 2. If so, what expenses for said office it paid in the fiscal year 1919-20, including rent, salaries of assistants, travelling expenses, etc. 3. What relation, if any, the said A. V. White is to James White, Deputy Head of the Conservation Commission. 4. If any other relatives of its Deputy Head were employed by the Conservation Commission in the past fiscal year, their names, what positions they fill and what salaries were paid them. 5. Whether it is the practice of the Government to maintain offices for all its consulting engineers. 6. Whether it is the intention of the Government to continue to defray the expenses of the Toronto office of the said A. V. White. 7. If the said A. V. White was employed by the Department of Public Works, what was the last year he was so employed and what remuneration he was paid. 8. At what annual salary rate he is being paid by the Conservation Commission for 1920-21. 9. What reports, if any, by A. V. White, other than reports on water-powers and hydro-electric conditions, the Conservation Commission has published. 10. Whether A. V. White holds the degree of Electrical Engineer from a recognized university. 11. Name of the Hydro-Electric Engineer of the Conservation Commission. 12. What degrees he holds and what practical experience he has had. 13. What annual salary he is paid. Presented May 3, 1920. Mr. Casgrain. *Not printed*

145. Return showing:—1. How many farms in each constituency in the province of Quebec were purchased by returned soldiers under the provisions of the Soldiers' Settlement Act. 2. The names of the buyers and sellers of each of the said farms. 3. The price paid for each of these farms. 4. Who visited each of the said farms on behalf of the Government. 5. What assistance was given by the Government in connection with each purchase. Presented May 3, 1920. Mr. Tobin . . . . . *Not printed.*

146. Return to an Order of the House of the 19th April, 1920, for a Return showing:—1. Whether there was any printing done for the Government outside of the Printing Bureau during the years 1918, 1919. 2. If so, by whom. 3. Addresses of persons or firms to whom such printing was given. 4. Amount paid for this outside printing, in each case, in 1918-19. Presented May 4, 1920. Mr. Dechesne . . . . . *Not printed.*

147. Return to an Order of the House of the 19th April, 1920, for a Return showing:—1. Amounts loaned or credits given by the Government of Canada: (*a*) to Greece; (*b*) to Rumania. 2. The dates these loans were granted or credits given: (*a*) to Greece; (*b*) to Rumania. 3. The nature of merchandises purchased by the Government of Canada and charged in each case: (*a*) to Greece. (*b*) to Rumania. 4. The names of commercial firms or persons from whom said goods were so purchased, specifying: (*a*) the nature of goods in each case. (*b*) the amounts paid by the Government to these firms or persons in each case and also the date of these payments. Presented May 5, 1920. Mr. Archambault. . . . . *Not printed*

148. Return to an Order of the House of the 10th March, 1920, for a copy of all telegrams, petitions, letters and documents of all kinds sent to the Post Office Department referring in any way to the mail route and mail service between Mabou, N.S., and Whycocomagh, N.S. Presented May 5, 1920. Mr. Chisholm. . . . *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

149. Return to an Order of the House of the 31st March, 1920, for a copy of all correspondence, reports and other documents in any way referring to a proposed change in the site of Beatonville Post Office, Inverness County, N.S. Presented May 5, 1920. Mr. Chisholm . . . . . *Not printed.*

150. Return showing:—1. How many persons are employed on the staff of the Civil Service Commission. 2. Their names. 3. The respective salaries of said persons. Presented May 6, 1920. Mr. Hocken . . . . *Not printed.*

151. Return to an Order of the House of the 26th April, 1920, for a return showing the total quantity in gallons, of spirituous liquors imported into Canada during the years 1913, 1914, 1915, 1916, 1917, 1918 and 1919; and also showing the value in money of the said imports during the same years. Presented May 10, 1920. Mr. Archambault *Not printed.*

152. Return to an Order of the House of the 3rd May, 1920, for a copy of all correspondence and reports concerning the dismissal of Mr. Elisée Parent, inspector of Inland Revenue, the 6th of September, 1916 (file No. 111085). Presented March 10, 1920. Mr. Rinfret . . . . . *Not printed.*

152a. Supplementary Return to an Order of the House of the 3rd May, 1920, for a copy of all correspondence and reports concerning the dismissal of Mr. Elisée Parent, inspector of Inland Revenue, the 6th of September, 1916 (file No. 111085). Presented May 17, 1920. Mr. Rinfret . . . . . *Not printed.*

153. Return to an Order of the House of the 10th March, 1920, for a copy of all correspondence between the Dominion Government or any member thereof and the Dominion Manufacturers' Association or any manufacturer, relating to appeals from the Supreme or other courts in regard to validity of certain Dominion or Provincial Acts and Provincial Licenses whereby the Dominion Government undertook to give financial aid to said manufacturers for said appeals, as shown in the *Financial Times*, Montreal, of the 21st February, 1920. Presented May 10, 1920. Mr. Devlin. . . . . *Not printed.*

154. Return to an Order of the House of the 19th April, 1920, for a Return showing:—1. Number of translators employed by the Senate, House of Commons and the different departments of the Government, and number employed by each department. 2. Number employed permanently. 3. Number engaged for the session only 4 Total annual cost of the translation service. 5. Whether any translation was done outside of Ottawa during the fiscal year ending 31st March, 1919. 6. If so, in how many instances, and what rate was paid per page of printed matter Presented May 10, 1920. Mr. Hocken . . . . . *Not printed.*

155. Return to an Order of the House of the 5th May, 1920, for a copy of a letter from the Board of Trade of the City of Quebec to the Minister of Trade and Commerce, dated October 24, 1919, concerning the new policy adopted by the Ocean Mail Steamers of not stopping at Quebec in their outward voyage, and a copy of the answer to said letter. Presented May 10, 1920. Mr. Lapointe . . . . *Not printed.*

156. Return to an Order of the House of the 29th April, 1920, for a Return showing:—1. Name of each official and clerk in the Fisheries Branch at Ottawa who will be in receipt of a salary of $1,800 or over during the fiscal year 1920-21 2. Salary of each such official and clerk during the fiscal years 1916-17, 1917-18, 1918-19 and 1919-20. 3. Minimum and maximum salary of each such official and clerk as at present fixed by the classifying experts of the Civil Service Commission. 4. What the salary of each such official and clerk will be during the fiscal year 1920-21. 5. What practical experience or direct connection, if any, each such official and clerk has had in or with the fishing industry; the nature of such experience or connection and the number of years it covers. 6. What position each such official and clerk, who has had no practical experience in or direct connection with the fishing industry, filled or what duties he performed on first becoming attached to the Fisheries Branch. 7. Present duties and responsibilities of each such official or clerk. Presented May 10, 1920. Mr. Duff . . . . *Not printed.*

157. Return to an Order of the House of the 3rd May, 1920, for a copy of all correspondence, telegrams, and other documents exchanged between Dr. L. W. McNutt, Vancouver, B.C., and the Department of Soldiers' Civil Re-establishment, Sir Robert Borden and the Director of Medical Services of the Soldiers' Civil Re-establishment, with reference to claim for $2,590.72 by the said Dr. McNutt against the above mentioned department, and also with reference to the resignation or dismissal of the said Dr. McNutt from the department in question. Presented May 11, 1920. Mr. Power. . . . . *Not printed.*

158. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Labour Department. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken . . . . . *Not printed.*

158a. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Post Office Department. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken *Not printed.*

158b. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Secretary of State Department, including the Printing Bureau. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken. *Not printed.*

158c. Return to an Order of the House of the 12th April, 1920, for a Return showing:—1. Number of persons employed by the Civil Service Commission. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken . . . . *Not printed.*

158d. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Department of Interior. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken . . . . *Not printed.*

158e. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Marine and Fisheries Department 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken . . . . *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

158*f*. Return to an Order of the House of the 22nd March, 1920, for a Return showing:—1. Number of employees in the inside service of the Finance Department including the Insurance Branch. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Tobin . . . . . *Not printed.*

158*g*. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Department of Trade and Commerce. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 11, 1920. Mr. Hocken . . . . . *Not printed.*

158*h*. Return to an Order of the House of the 17th March, 1920, for a Return showing:—1. Number of employees in the inside service of the Militia Department. 2. How many are males. 3. How many are females. 4. How many males are French. 5. How many females are French. 6. How many males are Protestants. 7. How many females are Protestants. Presented May 17, 1920. Mr. Hocken . . . . . *Not printed.*

159. Return to an Order of the House of the 26th April, 1920, for a Return showing:—1. What institutions are at present under the jurisdiction and management of the Department of Soldiers' Civil Re-establishment. 2. Number of patients in each institution. 3. Number of employees in each institution. 4. Cost per year of each institution. Presented May 12, 1920. Mr. Pardee . . . . . *Not printed.*

160. Fifth Annual Report of the Board of Directors of the Canadian Northern Railway System, for the year ended December 31, 1919. Presented by Hon. Mr. Reid, May 12, 1920. . . . . *Printed for sessional papers only.*

161. First Annual Report of the Board of Directors of Canadian Government Merchant Marine, Limited. Presented by Hon. Mr. Reid, May 12, 1920 . . . . . *Printed for sessional papers only.*

162. Return to an Order of the House of the 12th May, 1920, for a Return showing:—1. Sales of military and other supplies made by the War Purchasing Commission in each of the years 1917, 1918 and 1919, and amount of money obtained for these supplies in each of the above years. 2. Whether these supplies were sold by tender, by advertisement, or at public auction. 3. How military supplies, including rugs, furniture, etc., at Camp Borden were sold, who the purchasers were and what prices were received for the various articles. Presented May 14, 1920. Mr. Ross *Not printed.*

163. Return to an Order of the House of the 19th April, 1920, for a copy of all papers, letters, correspondence between the Department of Justice or any of its officers and the Civil Service Commission or any of its members with reference to the promotion of the Secretary to the Deputy Minister of Justice in 1919 and 1920. Presented May 14, 1920. Mr. Cahill . . . . . *Not printed.*

164. Return to an Order of the House of the 24th March, 1920, for a copy of all correspondence and telegrams between the Dominion Government and the Alberta Government relating to irrigation development in Alberta, and more particularly to Lethbridge Northern Irrigation District. Presented May 17, 1920. Mr. Buchanan . . *Not printed.*

165. Return to an Order of the House of the 5th May, 1920, for a Return showing the names of all persons who have passed the Civil Service examinations from the province of Prince Edward Island in 1917, 1918 and 1919, showing: (*a*) the grade for which they passed; (*b*) the number of marks made by each; (*c*) those who are returned soldiers; (*d*) those who have received an appointment, with the name of their position. Presented May 17, 1920. Mr. Sinclair (P.E.I.). . . . . *Not printed.*

166. Return to an Order of the House of the 12th April, 1920, for a Return showing:—1. Number of Civil Service Investigating Commissions appointed since the 1st of January, A.D. 1895. 2. On what respective dates said Commissions were appointed, what number of Commissioners comprised each Board, their names and their home addresses. 3. How long each Board was engaged on such inquiry and how much was paid to each. 4. Whether there is any Board or any Member of a past or present Board now engaged in connection with the Civil Service inquiry or classification of the Civil Service, other than the regular Civil Service Commission of which Honourable Doctor Roche is the Chairman. 5. What amount or amounts were paid by the Government to the Civil Service Classification Commissioners during the time from 1st January, 1916, to and including the 15th of March, A.D. 1920, what amounts were paid to each of the said Classification Commissioners and on what dates. Presented May 17, 1920. Mr. McKenzie. . . . . *Not printed.*

167. Return to an Order of the House of the 17th May, 1920, for a Return showing:—1. Number of married women whose husbands did not serve in the Canadian Expeditionary Force who are in the pay of various Government departments at Ottawa. 2. Whether it is a fact that the Department of Immigration has in its employ a lady at a salary of $300 per month. 3. Whether this lady is the wife or mother of a returned soldier, and whether any effort was made at the time of her employment to secure the services of a war widow or dependent. 4. Whether this lady's husband is in the employ of the Government or of one of the provincial governments. 5. Whether it is a fact that the daughters of several departmental heads are employed by their fathers in Government service and that in such cases these young ladies hold positions which could be well filled with men who have been trained by the Department of Soldiers' Civil Re-establishment for the Civil Service but are unable to secure appointments. Presented May 19, 1920. Mr. Andrews . . . . . *Not printed.*

168. Copy of Order in Council, P.C. 1595, dated 31st July, 1919, Appointment of Victory Loan Special Committee in connection with the stabilizing of the Victory Loan of 1917. Presented by Sir George Foster, May 20, 1920. *Not printed.*

169. Reports submitted by the Officer in charge of the Canadian War Records Office, London, England, to the Right Honourable Sir Robert L. Borden, G.C.M.G., M.P., Prime Minister of Canada; and to the Honourable Sir Edward Kemp, K.C.M.G., M.P., Minister, Overseas Military Forces of Canada, 1916-1919, with which is included a Report of the Executive Committee of the Canadian War Memorials Fund. Presented by Sir Robert Borden, May 20, 1920. . . . . *Not printed.*

170. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Indian Affairs in Ottawa. 2. Their names and salaries. Presented May 21, 1920. Mr. Hocken. . . . . *Not printed.*

170*a*. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Labour in Ottawa. 2. Their names and salaries. Presented May 21, 1920. Mr. Hocken. *Not printed.*

5951—j

CONTENTS OF VOLUME 10—*Continued.*

170*b*. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Marine in Ottawa. 2. Their names and salaries. Presented May 21, 1920. Mr. Hocken. *Not printed.*

170 Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Public Archives in Ottawa. 2. Their names and salaries. Presented May 26, 1920. Mr Hocken *Not printed*

170*d*. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Trade and Commerce in Ottawa. 2. Their names and salaries. Presented May 26, 1920 Mr. Hocken *Not printed*

170*e*. Return to an Order of the House of 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of the Secretary of State in Ottawa. 2. Their names and salaries. Presented May 31, 1920. Mr. Hocken *Not printed*

170 Return to an Order of the House of 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Mines in Ottawa. 2. Their names and salaries. Presented May 31, 1920. Mr. Hocken. *Not printed.*

170*g*. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Naval Service in Ottawa. 2. Their names and salaries. Presented May 31, 1920. Mr. Hocken *Not printed.*

170*h*. Return to an Order of the House of the 19th May, 1920, for a Return showing: 1. Number of employees in the Department of Justice in Ottawa. 2. Their names and salaries. Presented May 31, 1920. Mr. Hocken. *Not printed.*

170.. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of the Interior in Ottawa. 2. Their names and salaries. Presented June 2, 1920. Mr. Hocken. *Not printed.*

170 Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Railways and Canals in Ottawa. 2. Their names and salaries. Presented June 8, 1920. Mr. Hocken... *Not printed.*

170*k*. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Public Works in Ottawa. 2. Their names and salaries. Presented June 10, 1920. Mr Hocken *Not printed*

170*l* Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Soldiers' Civil Re-establishment in Ottawa. 2. Their names and salaries. Presented June 14, 1920. Mr. Hocken *Not printed.*

170*m*. Return to an Order of the House of 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Public Printing. 2. Their names and salaries. Presented June 17, 1920. Mr. Hocken *Not printed*

170*n*. Return to an Order of the House of 19th May, 1920, for a Return showing:—1. Number of persons employed in the Department of Public Health. 2. Their names and salaries. Presented June 17, 1920. Mr. Hocken *Not printed.*

170*o*. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Number of employees in the Post Office Department in Ottawa. 2. Their names and salaries. Presented June 18, 1920. Mr. Hocken *Not printed.*

171. Also,—Return to an Order of the House of the 5th May, 1920, for a copy of a letter signed by twenty-two Senators and Members of the House of Commons representing the Provinces of Alberta, Saskatchewan and Manitoba, addressed to Sir Robert L. Borden, Prime Minister of Canada, dated September, 1919, recommending the shipment of grain by rail via Quebec; also a copy of the answer to such letter as well as the letters sent by J. T. Ross, Esq., President of the Quebec Board of Trade, to the Minister of Railways and Canals during the months of January and February, 1920, concerning export of wheat via Quebec, and of the letters of the Minister of Railways and Canals in answer thereto. Presented May 21, 1920. Mr. Lapointe *Not printed.*

172. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Who the publishers are of the *Montreal Gazette*. 2. Amounts paid to the Montreal Gazette Publishing Company for each of the last fiscal years by the Dominion Government for (*a*) advertising, and (*b*) job printing. Presented May 21, 1920. Mr. Edwards. *Not printed.*

173. Return to an Order of the House of the 7th April, 1920, for a copy of all correspondence, letters and petitions received from the citizens of the Saguenay district and all others in connection with a subsidy from the Department of Trade and Commerce in order to obtain the services of a steamboat ferry between Ste. Catherine and Tadoussac. Presented May 21, 1920. Mr. Savard *Not printed.*

174. Return to an Order of the House of the 19th March, 1919, for a return showing the names and post office addresses of all postmasters appointed in the Province of Nova Scotia since June 1, 1917, along with a copy of all correspondence with the Post Office Department or with the Civil Service Commission relating to such appointments. Presented May 26, 1920. Mr. Sinclair (Antigonish) *Not printed.*

175. Return to an Order of the House of the 3rd May, 1920, for a copy of the mortgage deeds for the twenty-five and the thirty-five million dollars granted by the Government of Canada to the Canadian Northern Railway Company in 1918 and 1919. Presented May 26, 1920. Mr. Papineau *Not printed.*

176. Return to an Order of the Senate dated the 4th instant, for a Return showing all correspondence that may have taken place with the British Admiralty, and with the Naval Mission to India and the Dominion, 1919-20, and also a list of shareholders, officers and directors of the Imperial Oil Company. The Senate *Not printed.*

177. Return to an Order of the Senate dated the 5th instant, for a Return of copies of contracts between any Department or Departments of the Government and the owners of the steamship *Lady Evelyn*, in respect to the carriage of mails, passengers and freight between Pictou, Souris, and the Magdalen Islands; and copies of schedules of rates for such service, if such schedules are in the possession of the Government. The Senate *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

178. Return to an Order of the House of the 10th May, 1920, for a Return showing:—1. Whether inspectors in charge of terminal elevators, under the Board of Grain Commissioners, have full authority to inspect grain, as provided for in the Canada Grain Act. 2. If not, why not. 3. If so, whether the inspectors issue the requisite inspection certificates, with their signatures attached thereto, as evidence of such inspection. 4. Whether the Chief Inspector or his immediate assistant, in charge of terminal elevators, has authority to change such inspection, without consent of the inspector directly in charge of a terminal elevator. 5. If so, whether this practice is provided for in the Canada Grain Act. 6. Whether inspection certificates, either inwards or outwards, are signed in blank by an officer under the Board of Grain Commissioners, and then filled in afterwards by a clerk. 7. Whether Western Inspection Certificates are signed in blank by the Chief Inspector or one of his officers, and then filled in by an officer in the Eastern Inspection District. 8. Whether the inward and outward inspection at terminal elevators is identically the same. 9. Whether the Canada Grain Act provides for the inspection of grain into terminal elevators, from steamers and barges. 10. If so, whether the inward or outward inspection governs. 11. How much grain the Government elevator, Port Arthur, has handled from September 1, 1919, to May 1, 1920. 12. How many bushels the above elevator is milled during the following crop years, 1913-14, 1914-15, 1915-16, 1916-17, 1917-18, 1918-19. 13. Cost per bushel in handling grain in the Government elevator, Port Arthur, for the above crop years, and for the period, September 1, 1919, to May 1, 1920. 14. Whether the above cost includes any provision for interest on investment and management. 15. Revenue per bushel for the above period: (*a*) including as revenue, money derived from the sale of overages, screenings and sealpings; (*b*) excluding as revenue, money derived from the sale of overages, screenings and sealpings. 16. Number of employees engaged in the above elevator during the above periods. 17. Name of the senior officer or manager who superintended the operations of the Government elevators under the Department of Trade and Commerce, for the above periods. 18. Whether all the Government elevators carry insurance on grain stored therein, in accordance with law. 19. If not, why the discrimination in favour against the other companies and elevators, and on whose authority the law is broken. 20. Section 45, subsection 7, of the Canada Grain Act provides for the confiscation of overages over one-quarter of one per cent to the Government. Whether the Board of Grain Commissioners are keeping strict accounting of all grain going into and out of the terminal elevators, including screenings and sealpings, so as to arrive at the above figures. 21. Whether the Registration Department, under the Board of Grain Commissioners, has full information tabulated showing the gross weight in and gross weight out of terminal elevators. 22. Change made by the Board of Grain Commissioners in the wording of the outbound weight certificates. 23. When the change was made. 24. Whether the weight certificate, as worded, was considered faulty up to the time of the change. 25. If not, why the change in the wording was made. 26. Whether the Canada Wheat Board has an officer at Fort William, whose duty it is to check the grades given by the inspection department under the Department of Trade and Commerce, on all grains shipped for and on account of the Canada Wheat Board. 27. If so, how many officers are engaged in this office, their names and salaries. 28. If so, what the necessity is of two Government officials doing the one task. 29. If so, whether the expenses incidental to this office are deducted from the moneys which ought rightly be given to the farmers, for the participation certificates issued. 30. Whether the Canada Wheat Board accepts the inspection certificates as issued by the Department of Trade and Commerce, without reservation. 31. Whether the Canada Wheat Board always avails itself of the highest market for all wheat sold for and on account of the producers. 32. Since the Government has taken over the control of the wheat business, whether this has held a tendency to reduce the work of the Board of Grain Commissioners. 33. If so, whether the number of employees under the Board of Grain Commissioners have been reduced, for the purposes of economical administration. 34. Whether the administration of the Canada Grain Act is self-sustaining. 35. If not, how the deficiencies are made up from year to year and on whose authority. 36. Salaries paid to the Secretary of the Board of Grain Commissioners and the Secretary of the Canada Wheat Board. 37. Whether the public terminal elevators at Fort William or Port Arthur purchase and sell grain from time to time, contrary to the Canada Grain Act. 38. If so, on whose authority. 39. Section 48 of the Canada Grain Act provided for the fixing of grades other than statutory grades by the Grain Standards Board. Whether this Board has fixed the composition of grades of: (*a*) screenings, (*b*) sealpings. 40. If not, why not. 41. If not, who has fixed the composition and grades up to the present time, and on what authority. 42. If fixed, what they are. 43. Whether the original docklages taken from the grain are returned to the producer or the buyer of the warehouse receipt covering the specific parcel. 44. If not, why not. 45. How long the Government, through the Department of Agriculture, has handled standard stock food ex terminal elevators. 46. Whether the venture has been profitable. 47. Surplus or deficit for each year. 48. Price paid to the terminal elevators for the standard stock food basis f.o.b. Fort William. 49. Price received by the Government for the same food on the same basis. Presented May 27, 1920. Mr. Stevens. *Printed for sessional papers only.*

179. Memorandum No. 6, respecting work of the Department of Militia and Defence—European War—from November 1, 1918, to October 31, 1919. Presented by Hon. Mr. Guthrie, May 28, 1920. *Not printed.*

180. Return to an Order of the House of the 12th May, 1920, for a Return showing:—1. Whether the Government operations at the Dog Fish Reduction Works at Clark's Harbour, Nova Scotia, have been discontinued. 2. If so, what disposition has been made of the property. 3. Total Government disbursements including the original cost and loss in operation. 4. On whose report or recommendation the operation was abandoned. 5. Recommendation of the authority advising abandonment. 6. Whether J. B. Fielding, of the Honorary Advisory Council for Scientific and Industrial Research, authorized the report of the chairman on fish waste in Canada as intimated on page 53 of the report of the Administrative Chairman of the Honorary Advisory Council for Scientific and Industrial Research for the year ending March 31st, 1919. 7. Whether Mr. Fielding reported with regard to the above-mentioned plant as follows: "At Clark's Harbour I inspected the Government Dog Fish Reduction plant, which though very badly cared for appeared to be in working order, and well worth, in my opinion, retaining for the purpose of the manufacture of fertilizer, though quite unsuitable for the manufacture of food." 8. Consideration given by the Government to Mr. Fielding's report. Presented May 28, 1920. Mr. McCurdy. *Not printed.*

181. Return to an Order of the House of the 12th May, 1920, for a return showing the total amounts paid for advertisements or newspaper articles relating to voluntary enlistment before the Military Service Act of 1917 was in force: (*a*) to English newspapers in Canada and United States; (*b*) to French newspapers in Canada and United States; (*c*) to English newspapers in the province of Quebec; (*d*) to French newspapers in the province of Quebec. Presented May 28, 1920. Mr. Archambault. *Not printed.*

182. Return to an Order of the House of the 15th March, 1920, for a Return showing:—How many of the 22,954 temporary appointments made by the Board of Civil Service Commissioners since the armistice are at present on the pay rolls of the various departments of the Government. Presented May 28, 1920. Mr. Sinclair (Antigonish). *Not printed.*

183. Return to an Order of the House of the 3rd May, 1920, for a Return showing:—1. How many generals belonging to the permanent force have had to give up their rank during the last six months. 2. How many generals have been promoted since the armistice, and the names of those who are still in the service. 3. How many officers have

CONTENTS OF VOLUME 10—*Continued.*

been promoted brigadier general since the armistice, their names, how they are employed, and whether it is the intention to retain them in that rank. 4. How many officers of the permanent force have been pensioned, their names and the amount of pension. Presented May 28, 1920. Mr. Bureau . . . . . *Not printed.*

184. Final report of the work of Canadian Munition Resources Commission, from November, 1915, to March, 1919, inclusive. Presented by Sir Robert Borden, May 31, 1920 . . . . . *Not printed.*

184a. Copy of Order in Council, P.C. 1192, dated the 29th May, 1920; Dissolving the Canadian Munitions Resources Commission. Presented by Sir Robert Borden, May 31, 1920. . . . . *Not printed.*

185. Return to an Order of the House of the 26th April, 1920, for a copy of all correspondence between the Government or any member thereof and the Canadian Press, Limited, and the Canadian Associated Press, with regard to the establishment of an Imperial news service. Presented May 31, 1920. Mr. Robb . . . . *Not printed.*

186. Return to an Order of the House of 3rd May, 1920, for a copy of all correspondence, telegrams, petitions or any other documents relative to the appointment of the Deputy Postmaster at Edmonton, Alberta. Presented May 31, 1920. Mr. Mackie (Edmonton.) . . . . . *Not printed.*

187. Return to an Order of the House of 31st March, 1920, for a copy of all correspondence, letters, telegrams, reports by detectives and others, and every document relating to the theft of Fifty Thousand dollars from the post office in the City of Edmonton, and to George Armstrong, Postmaster of the said post office, as well as to all employees in the said post office so far as all these may relate to the theft of Fifty Thousand dollars. Presented May 31, 1920. Mr. Mackie (Edmonton.). . . . . *Not printed.*

188. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Names and respective salaries of the employees of the Parliamentary Library. 2. How many are graduates of any college in Arts or Library Science. 3. Whether it is the intention of the Government to make any more appointments to the said Library of persons who have not taken a library science course in some recognized college. Presented May 31, 1920. Mr. Wigmore . . . . . *Not printed.*

189. Return to an Order of the House of the 17th May, 1920, for a Return showing:—1. Whether the steamship *Metagama* sailed from Liverpool carrying soldiers and their families on or about the eighth day of February, A.D. 1919. 2. Complaints made to the Militia Department or any other department of the Government as to the condition of said steamer at time of sailing and during said voyage. 3. Complaints made to the Government or any department thereof as to the treatment accorded to said soldiers, their wives or families during said voyage. 4. Whether a delegation from the City of St. John appeared before a committee of the Cabinet on or about the 27th day of February, 1919, protesting against alleged ill treatment of said soldiers and their families during the said voyage. 5. If so, who comprised said delegation and what members of the Government acted on said Cabinet committee. 6. Whether the Government took any action as a result of said conference. If so, what action, and the result of same. 7. Whether said delegation filed affidavits or solemn declarations of passengers as to the condition of the steamer and treatment accorded said passengers during said voyage. 8. If so, whether the Government held an investigation concerning said complaints. 9. Result of such investigation. Presented June 2, 1920. Mr. Copp . . . . . *Not printed.*

190. Return to an Order of the House of the 19th May, 1920, for a Return showing:—1. Total amount of sick mariners' dues collected from shipping entering Canadian ports for each of the years 1912, 1913, 1914, 1915, 1916, 1917, 1918 and 1919. 2. Amount expended by the Government in assistance to sick or distressed mariners during each of said years. 3. Number of officials of the Marine Department in Ottawa engaged exclusively on duties connected with collection, distribution and administration of sick mariners' dues. 4. Number of officials of Marine Department transferred to Health Department in connection with sick mariners' dues. Presented June 2, 1920. Mr. Stevens . . . . . *Not printed.*

191. Return to an Order of the House of the 10th March, 1920, for an order showing:—1. Number of dismissals of Civil Servants made in the cities of the Dominion of Canada since the 1st of January, 1915. 2. Number of appointments which have taken place or have been made of Civil Servants in the cities of the Dominion of Canada since January, 1915. Presented June 2, 1920. Mr. Mackie (Edmonton.) . . . . . *Not printed.*

192. Return to an Order of the House of the 10th March, 1920, for a return giving a list of the lawyers from the province of Quebec who acted: (*a*) as public representatives; (*b*) military representatives; (*c*) in the office of the registrars; and (*d*) in the office of the Central Appeal Judge, during the administration of the Military Service Act, showing the amount paid to each of the said lawyers. Presented June 4, 1920. Mr. Archambault . . . *Not printed.*

193. Copies of Orders in Council, P.C. 1022, dated 8th May, 1920, P.C. 1065, dated 15th May, 1920, and P.C. 1280, dated 4th June, 1920, covering the Cost of Living Bonus for employees in the Civil Service of Canada for the fiscal year, 1920–21. Presented by Hon. Mr. Rowell, June 7, 1920 . . . . . *Not printed*

194. Copies of Orders in Council in respect to the Federal Housing Scheme, as follows:—P.C. 639, of March 27, 1920, authorizing an increase in the maximum amounts of the loans which may be granted under Class (*a*) of the Federal project. P.C. 375, of February 20, 1919, approving the General Scheme of Housing of the Province of Ontario. P.C. 2201, of October 30, 1919, approving certain amendments to the British Columbia Housing Scheme, approved on May 1, 1919, P.C. 907. P.C. 1090, of May 19, 1920, approving certain amendments to the General Housing Scheme of the Provinces of Quebec. P.C. 1233, of May 31, 1920, approving the General Scheme of Housing of the Province of Saskatchewan. Presented by Hon. Mr. Rowell, June 7, 1920. . . . . *Not printed.*

195. Return to an Order of the House of the 5th May, 1920, for the production of copies of all letters, telegrams, papers and correspondence exchanged between the Department of Agriculture and others in reference to the establishment of a Demonstration Farm at Baie St. Paul, in the County of Charlevoix. Presented June 7, 1920. Mr. Casgrain. *Not printed.*

196. Return to an Order of the House of the 8th April, 1920, for a Return showing:—1. What is, or has been, the numerical strength of the staff of the Department of Public Works, by districts, throughout the Dominion of Canada since the 1st of January, 1915, to the 1st of January, 1920. 2. The names of the employees. 3. What salary is paid, or was, to each employee of the Department during this period. 4. Which of said employees could have been discharged since January, 1917. 5. How many employees in each district can now be dispensed with. 6. The expenditure in each of said districts during the entire period. Presented June 8, 1920. Mr. Mackie (Edmonton). *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

196. Supplementary Return to an Order of the House of the 8th April, 1920, for a Return showing:—1. What is, or has been, the numerical strength of the staff of the Department of Public Works, by districts, throughout the Dominion of Canada since the 1st of January, 1915, to the 1st of January, 1920. 2. The names of the employees. 3. What salary is paid, or was, to each employee of the Department during this period. 4. Which of said employees could have been discharged since January, 1917. 5. How many employees in each district can now be dispensed with. 6. The expenditure in each of said districts during the entire period. Presented June 17, 1920. Mr. Mackie (Edmonton). *Not printed.*

197. Return to an Order of the House of the 10th March, 1920, for a copy of all letters, telegrams, documents, petitions, reports, received by the Department of Railways and Canals and Canadian National Railways, and the correspondence exchanged between this Department and different persons and public bodies in reference to the curtailing of the railway service along the new line of the Quebec and Saguenay Railway between Quebec and Murray Bay since the 1st of November, 1919. Presented June 8, 1920. Mr. Casgrain *Not printed.*

198. Return to an Order of the House of the 7th April, 1920, for a copy of all correspondence, letters and telegrams in connection with the granting of an allowance by the Post Office Department for a regular postal ferry service by motor yacht between Ste. Catherine and Tadoussac. Presented June 8, 1920. Mr. Savard *Not printed.*

199. Return to an Order of the House of the 15th March, 1920, for a copy of all letters, petitions, telegrams and other documents relating to the retention in office, as a Fishery Overseer, of John A. Dillon, of Guysborough, N.S. Presented June 8, 1920. Mr. Sinclair (Antigonish) *Not printed.*

200. Return to an Order of the House of the 12th April, 1920, for a copy of all documents, letters, telegrams and all other papers and correspondence exchanged between the Government or any department or commission thereof and the Government of the United States, the State of New York, the State of Vermont, or any other body, and a copy of any evidence given before any commission, referring to seine or net fishing in Missisquoi bay. Presented June 8, 1920. Mr. Kay *Not printed.*

201. Return to an Order of the House of the 5th May, 1920, for a Return showing amount of money spent by the Dominion Government since Confederation on improvements in the harbours of Halifax, St. John, Quebec, Montreal, Toronto, Hamilton, Port Arthur, Victoria and Vancouver. Presented June 8, 1920. Mr. Foster (York). *Not printed.*

202. Orders of the Director of Coal Operations—Nos 1 to 144, inclusive. Presented by Hon. Mr Meighen, June 8, 1920. *Not printed.*

203. Return to an Order of the House of the 22nd March, 1920, for a Return showing:—1. Number of automobiles valued under $1,000 imported into Canada in each of the years 1918 and 1919. 2. Number valued at between $1,000 and $2,000. 3. Number at a greater valuation than $2,000 4. Duty collected on these automobiles. 5. The duty collected on parts of automobiles imported during the years 1918 and 1919. 6. On what number of automobiles valued at less than $1,000 excise duty was paid in the years 1918 and 1919. 7. On what number of automobiles valued at between $1,000 and $2,000 excise duty was paid in the same years. 8. On what number of automobiles valued at over $2,000 excise duty was paid in the same years. 9. The amount of such excise duty. Presented June 9, 1920. Mr. Ross *Not printed.*

204. Return to an Order of the House of the 5th May, 1920, for a copy of all papers, documents and letters in connection with Dr. Michel Fiset, of Quebec City, appointment by Order in Council, dated 18th April, 1914, as parcel post supervisor in Quebec City, with a salary of $2,800 a year. Presented June 10, 1920. Mr. Lavigueur *Not printed.*

205. First Annual Report of the Board of Commerce of Canada, dated 31st May, 1920; and also,—Copy of Order in Council, P.C. 1264, dated 1st June, 1920, submitting the above Report for His Excellency's information. Presented by Sir Robert Borden, June 10, 1920 *Not printed.*

206. Copy of Order in Council, P.C. 3529, dated December 18, 1919, regarding the distribution to the Provinces of the sum of $200,000, which was placed at the disposal of the Department of Health for combatting venereal diseases. Presented by Hon. Mr. Rowell, June 11, 1920 *Not printed.*

207. Copy of Agreement between the Chief and Principal men of the Chippewas of Sarnia Band of Indians and His Majesty the King regarding the surrender of the Sarnia Indian Reserve to the Government of Canada, dated at Sarnia, Ont., 10th December, 1919. Presented by Hon. Mr. Meighen, June 14, 1920 *Not printed.*

208. Return showing:—1. How many sittings were held by the Railway Commission to fix compensation for damages caused by the passing of the Canadian Northern through North Bay. 2. Who presided over the said sittings. 3. The awards made. 4. To whom they were paid. 5. The total cost of the said sittings. 6. The amount paid for counsel fees. 7. What amount was paid for witnesses. 8. To whom the amounts were paid. Presented June 16, 1920. Mr. McDonald *Not printed.*

208a. Supplementary Return to an Order of the House of the 16th June, 1920, for a Return showing:—1. How many sittings were held by the Railway Commission to fix compensation for damages caused by the passing of the Canadian Northern through North Bay. 2. Who presided over the said sittings. 3. The awards made. 4. To whom they were paid. 5. The total cost of the said sittings. 6. The amount paid for counsel fees. 7. What amount was paid for witnesses. 8. To whom the amounts were paid. Presented June 21, 1920. Mr. McDonald. *Not printed.*

209. Return to an Order of the House of 2nd June, 1920, for a copy of all papers, documents, telegrams and reports concerning the indemnity paid to the widow and children of J. L. A. Forbes, killed at Aston Junction, the 11th of September, 1918, while on duty as brakeman on the Government railways. Presented June 17, 1920. Mr. Bourassa *Not printed.*

210. Partial Return to an Order of the House of 5th May, 1920, for the production of copies of all Rules of Court made by the different Superior Courts of Criminal Jurisdiction of Canada according to the provisions of Section 576 of the Criminal Code. Presented June 17, 1920. Mr. Casgrain *Not printed.*

211. Return to an Order of the House of 19th March, 1920, for a copy of all correspondence between the Prime Minister of Canada and the Prime Minister of Great Britain under authority of a resolution of the Imperial War Cabinet of July 30, 1918. Presented June 17, 1920. Mr. Fielding *Not printed.*

CONTENTS OF VOLUME 10—*Continued.*

212. Copy of Order in Council, P.C. 1361, dated 16th June, 1920, accepting the resignation of Mr. W. F. O'Connor, as a Commissioner of the Board of Commerce of Canada; and also,—copy of letter communicating the said resignation. Presented by Sir Robert Borden, June 17, 1920 . . . . . *Not printed.*

213. Return to an Order of the House of the 26th May, 1920, for a copy of all correspondence, petitions, reports and other documents regarding the establishment of rural mail routes in the parishes of Champlain, Batiscan and St. Luc, in the County of Champlain, Quebec. Presented June 18, 1920. Mr. Desaulniers . . . . *Not printed.*

214. Return to an Order of the House of the 19th April, 1920, for a Return showing:—1. Number of non-Canadian born in the different Departments of the Government where the services of Engineers, Architects, Draughtsmen, etc., are required. 2. Number of non-Canadian born Engineers, Architects, Draughtsmen, etc., who have been given positions within the last five years in the different departments of the Government. 3. Number of Canadian born Engineers, Architects, Draughtsmen, etc., who have obtained similar positions within the last five years. 4. Whether American Engineers were given preference in obtaining such positions and appointed over the heads of Canadian born Engineers, Architects, etc. Presented June 21, 1920. Mr. Cosgrain . . . . *Not printed.*

215. Return to an Order of the House of the 10th May, 1920, for a Return showing:—1. Total amount of drawback for the fiscal year ending March 31, 1920, paid to textile manufacturers on *(a)* raw cotton, and *(b)* cotton yarns. 2. Total amount of drawback for the fiscal year ending March, 1920, paid to textile manufacturers on *(a)* raw wool, and *(b)* wollen yarns. Presented June 21, 1920. Mr. Reid (Mackenzie) . . . . . *Not printed.*

216. Copy of Order in Council number 1238, passed on the 31st day of May, 1920, concerning a contract entered into with Griffenhagen and associates at a rate of $10,000 per month. Presented June 21, 1920. Mr. Lemieux . . . *Not printed.*

217. Statement showing number of Employees in the several Departments of the Public Service for the fiscal year ending March 31, 1921, designated in accordance with the new Classification Schedules. Subject to possible amendment in some instances as the result of appeals pending but not yet finally disposed of. Presented by Hon. Mr. Powell, June 23, 1920 . . . . . *Not printed.*

218. Return to an Order of the House of the 31st May, 1920, for a copy of all letters, telegrams and other documents relating to the closing of the life saving station at Richibucto Beach, in the county of Kent, N.B. Presented June 24, 1920. Mr. Leger . . . . . *Not printed.*

219. Return to an Order of the House of the 15th April, 1920, for a Return showing:—1. When the work under the present scheme of development of Toronto Harbour was commenced. 2. Miles of docks included in this scheme and how much of this work has been completed. 3. Depth of water provided by this scheme. 4. Expenditure by the Dominion Government on this scheme for each year since the commencement of the work. 5. Number of ships and tonnage entered and cleared from this harbour each year since 1912. 6. Amount of water borne freight imported and exported to and from this harbour since 1912. 7. What reduction, if any, in freight rates on goods entering and leaving Toronto by rail has been secured by reason of the harbour improvements in question. 8. What the extent of land reclamation is in connection with this scheme. 9. Who the owner of this land is and what the policy of the Government is relative thereto. 10. Depth of the St. Lawrence canals and of the Welland canal. Presented June 24, 1920. Mr. Campbell . . . . . *Not printed.*

220. Return to an Order of the House of 12th May, 1920, for a copy of all letters, telegrams, correspondence, documents and other papers exchanged between the Dominion Government, or any official thereof, or the officials of the Canadian Government Railways and the Government of New Brunswick, or any official of the said Government, or any of the officials of the St. John and Quebec Railway Company with regard to the procuring of running rights for the trains of the St. John and Quebec Railway over the Canadian Pacific Railway between Westfield Beach and St. John. Also of all papers, document and correspondence exchanged between the Dominion Government or any official thereof or any officials of the Canadian Government Railways and the Canadian Pacific Railway Company or any official thereof, regarding the securing of the said running rights. Presented June 20, 1920. Mr. Caldwell. . . . . *Not printed.*

221. Return to an Order of the House of the 20th May, 1920, for a copy of all telegrams, letters and other documents relating to the closing of the Life Saving Station at Cheticamp, Inverness County, N.S. Presented June 26, 1920. Mr. Chisholm . . . . . *Not printed.*

222. Report of the Administrative Chairman of the Honourary Advisory Council for Scientific and Industrial Research of Canada, for the year ending March 31, 1920. Presented by Sir George Foster, June 26, 1920 . . . *Not printed.*

223. Ordinances of the Yukon Territory, passed by the Yukon Council in the year 1920. The Senate . . . *Not printed.*

224. Return to an Order of the House of the 23rd June, 1920, for a copy of letters, telegrams, petitions and documents of all kinds which passed between the Department of Public Works and any person during the years 1918, 1919, 1920, in any way referring to improvements made on Grand Etang Harbour, N.S. Presented June 30, 1920. Mr. Chisholm . . . . . *Not printed.*

225. Return to an Order of the House of the 28th April, 1920, for a Return showing:—1. Number of private assistant private, joint and associate secretaries appointed to members of the Cabinet, Chairman or Members of Commission since 1911, and how much money has been paid to each of them respectively. 2. Number of private, assistant private, joint and associate secretaries each of the Members of the Cabinet actually have. 3. Their names and respective salaries. 4. Number of employees in the office of each member of the Cabinet, their names and respective salaries. Presented June 30, 1920. Mr. Dechene . . . . . *Not printed.*

226. Return to an Order of the House of the 7th June, 1920, for a Return showing amounts paid to the following newspapers during the fiscal years 1919 and 1920 respectively for *(a)* advertising, *(b)* printing. *Montreal Gazette* and The Gazette Printing Company, *Montreal Daily Star*, *The Globe*, *The Mail and Empire*, Toronto, *The Telegram*, Toronto, *The Star*, Toronto, *The Journal* and *The Journal Press*, Ottawa, *The Citizen*, Ottawa. Presented June 30, 1920. Mr. Cowan . . . . . *Not printed.*

227. Return to an Order of the House of the 8th October, 1919, for a copy of all letters, telegrams, petitions, memorials or other papers or documents received by the Right Honourable the Prime Minister or any member of the Government during the year 1919 relating to the appointment of a Lieutenant-Governor for Prince Edward Island and the replies thereto. Presented June 30, 1920. Mr. Sinclair (Antigonish). . . . . *Not printed.*

CONTENTS OF VOLUME 10—*Concluded.*

228. Return to an Order of the House of the 26th May, 1920, for a Return showing: 1. Who are or were the men engaged by the Civil Service Commission to re-classify the Civil Service at Ottawa. 2. When they were employed and at what rate of wages. 3. Whether they are still in the service of the Civil Service Commission or are any of them in said service. 4. How much was paid to each of such assistants from date of engagement up to the end of April, 1920. 5. Total amount paid to the men so engaged from the date of the engagement to the end of April 1920. Presented June 30, 1920. Mr. McKenzie . . . . . *Not printed.*

229. Return to an Order of the House of the 29th September, 1919, for a Return showing the cost of the Military Hospital at Saint Anne de Bellevue; the number of patients received and treated therein, to date; expenses to date for maintenance as to, (*a*) coal; (*b*) wood; (*c*) electricity; (*d*) food; (*e*) lingerie; (*f*) remedies, (*g*) social events and recreations; the cost of theatre installed in hospital; names of physicians, officers, nurses and privates of the general services, showing those who went to the front, and those who did not; their nationality and religion; salaries paid to each of the said persons; and the names and salaries of the chaplains attached to the hospital. Presented June 30, 1920. Mr. Archambault . . . . . *Not printed.*

230. Return to an Order of the House of the 14th June, 1920, for a Return showing the names of the societies which have filed copies of policies complying with the provisions of the Insurance Act, 1910, Geo. V, Chap. 157, Section 115; the names of the societies which have neglected to file copies of policies as required by said Act, and to whom licenses have been issued for the current year; and names of any societies from whom licenses have been withheld. Presented June 30, 1920. Mr. Archambault . . . . . *Not printed.*

231. Halifax Graving Dock, *re* expropriation of. The Senate . . . . . *Not printed.*

REPORT OF THE WORK

OF THE

DEPARTMENT OF

SOLDIERS' CIVIL RE-ESTABLISHMENT

CANADA

DECEMBER, 1919

PRINTED BY ORDER OF THE HOUSE OF COMMONS

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1920

[No. 14.—1920.]

THE DEPARTMENT OF SOLDIERS' CIVIL RE-ESTABLISHMENT

Address: 22 Vittoria Street, Ottawa.

Head Office Personnel—

MINISTER—Senator the Honourable Sir James A. Lougheed, P.C., K.C.M.G.
PARLIAMENTARY SECRETARY—The Honourable Hugh Clark, M.P.
DEPUTY MINISTER—F. G. Robinson.
ASSISTANT DEPUTY MINISTER AND SECRETARY—E. H. Scammell.
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SUPERVISOR OF EXPENDITURES—J. F. Waddington.
GENERAL SUPERINTENDENT ENGINEERING BRANCH—J. H. Bower.
DIRECTOR MECHANICAL TRANSPORT—E. W. Cameron.

Unit Head Offices—

Nova Scotia and Prince Edward Island—
Nurses' Home, Camp Hill Hospital, Halifax, N.S.

New Brunswick—
Fredericton Hospital, Fredericton, N.B.

Quebec—
Drummond Building, Montreal, P.Q.

Ontario—
Eastern Ontario: Golden Lion Block, Kingston, Ont.
Central Ontario: 185 Spadina avenue, Toronto, Ont.
Western Ontario: Speedwell Hospital, Guelph, Ont.

Manitoba—
Notre Dame Investment, Building Winnipeg, Man.

Saskatchewan—
McCallum Hill Building, Regina, Sask.

Alberta—
Lancaster Building, Calgary, Alta.

British Columbia—
Board of Trade Building, Vancouver, B.C.

Yukon Territory—
Dawson City, Y.T.

Overseas Office—

Whitehall House, 29 Charing Cross, London, England.

CONTENTS.

PAGE.

Accounting Branch, Report on.. 64
Disbursements, Statement of.. 68

Chief Inspector's Branch, Report on.. 60

Dietary Branch, Report on.. 61

Information and Service Branch, Report on.. 54
Federal Emergency Appropriation, results.. 58
Functions.. 56
Introduction.. 54
Method of work.. 57
Organization.. 55

Introduction... 7

Medical Services, Report on.. 11
Dental Cases, treatment of.. 18
Epilepties, Feeble Minded and Problem Cases, treatment of.. 17
Functions.. 11
Hospitals for the Insane, Departmental.. 21
Hospitals for the Insane, other than Departmental.. 22
Hospitals, General Treatment, Departmental.. 21
Hospitals, General Treatment, other than Departmental.. 22
Incurables and Long Treatment cases, treatment of.. 16
Insane, treatment of the.. 15
Medical Directors, Unit, Addresses of.. 23
Medical Quarterly.. 19
Medical Representatives, Schedule of.. 24
Medical Staff, Classification of.. 25
Organization.. 11
Orthopædic Cases, treatment of.. 17
Patients on strength, January 3, 1920.. 23
Personnel, composition of.. 12
Sanatoria, T. B., Departmental.. 21
Sanatoria, T. B., other than Departmental.. 22
Social Service Workers.. 19
Tuberculosis, treatment of cases of.. 13
Venereal Diseases, treatment of.. 18

PAGE.

Orthopædic and Surgical Appliances Branch, Report on.. 26

Artificial Limbs, cost of.. 28
Artificial Limbs and Appliances, number supplied to patients.. 29
Artificial Limbs and Appliances, standard issue of.. 29
Organization.. 26
Research Division.. 28
Staff, classification of.. 30

Purchasing Branch, Report on.. 68

Supplies and Equipment Branch, Report on.. 69

Vocational Training, Report on.. 30

Articles made by patients, sale of.. 37
Blind, care of the.. 45
Costs and Statistics.. 51
Curative Workshops.. 37
Discipline of Students.. 35
Follow-up System.. 33
Industrial Surveys.. 42
Inspectors, Vocational.. 35
Interviewing.. 40
Interviewing of Applicants.. 34
Occupations in which training is given.. 52
Occupations taught, diversity of.. 31
Occupations, Ward.. 35
Occupations, Ward, Value of.. 36
Organization of Vocational Branch, original.. 31
Organization of Vocational Branch, present.. 34
Medical Advisers, Vocational.. 35
Minors.. 47
Results, after care.. 48
Retraining Courses, selection of.. 41
Retraining, Daily hours of.. 39
Retraining, Industrial.. 38
Retraining, Industrial, the part of employers in.. 39
Retraining, Industrial, medical aspect of.. 43
Retraining, length of course in.. 40
Surveys, Industrial.. 42
Ward Aides, training of.. 36
Ward Occupations.. 35
Workshops, Curative.. 37

APPENDICES.

PAGE.

1 Negotiations with the Imperial Authorities and others—report of Assistant Deputy Minister's visit to England.. 72

2 Order in Council P.C. 2025, 1919, acceptance and confirmation by the Privy Council of Canada of the arrangements made with the Imperial Authorities.. 99

3 Circulars issued by Imperial Authorities regarding Medical treatment and training, etc., of ex-members of the Canadian Forces resident in the United Kingdom.. 101

4 Report on Vocational Training in the United Kingdom by Messrs. W. E. Segsworth, M.E., and T. A. Stevenson.. 113

5 Negotiations with the Government of United States—Reciprocal Agreement —report of the Assistant Deputy Minister—Orders in Council P.C. 424, 1919, and P.C. 1342, 1919.. 122

6 Department of Soldiers' Civil Re-establishment Act, 1918, with Amendment Act, 1919.. 133

7 Order in Council P.C. 2324, 1919—re-enacting Orders in Council passed under authority War Measures Act, 1914.. 136

8 Order in Council P.C. 387, 1919—as amended by Order in Council P.C. 804, 1919, under which the Department may carry on certain work and grant allowances to men undergoing treatment or training.. 137

9 Order in Council P.C. 1993, 1918, under which the Department may deal with insane ex-members of the Forces.. 148

10 Orders in Council P.C. 814, 1919, and P.C. 1846, 1919, under which the Department may give Vocational Training and pay and allowances to minors under military age of 18 years.. 152

11 Orders in Council P.C. 1040, 1919, P.C. 1845, 1919, and P.C. 2131, 1919—limiting period during which applications for re-training may be made by ex-members of the Forces entitled to the same.. 154

12 Order in Council P.C. 2039, 1918, outlining regulations for the protection of artificial limbs, etc., manufactured by the Department.. 157

13 Order in Council P.C. 2418, 1918—authority for the distribution of estates of deceased ex-members of the Forces, who die while on the strength of the Department.. 159

PAGE.

14 Order in Council P.C. 1742, 1919—arrangements with the Government of Australia regarding repatriation of Australians in Canada.. 160

15 Order in Council P.C. 2419, 1919—regulations regarding War Service Gratuity due to ex-members of the Forces on strength of Department for treatment.. 162

16 Order in Council P.C. 2328, 1919—authority under which Department may make special provision for care of subnormal men.. 165

17 Order in Council P.C. 2329, 1919—authority under which Department may issue loans for purchase of tools and for training or education in certain specified cases.. 166

18 Order in Council P.C. 2327, 1919—authority under which Department may issue pay and allowances to men who commence vocational training pending approval of their courses.. 167

19 Order in Council P.C. 2325, 1919—authority under which Department may make free issues of clothing.. 168

20 Order in Council P.C. 2301, 1919—authority under which Department may pay interest on credit balances of ex-members of the Forces undergoing treatment.. 169

Introductory Letter

TO REPORT OF THE

Department of Soldiers' Civil Ree-stablishment.

Senator, the Honourable Sir JAMES A. LOUGHEED, P.C., K.C.M.G.,
Minister of Soldiers' Civil Re-establishment,
Ottawa.

SIR,—In accordance with your instructions, I have the honour to submit a report on the work of the Department of Soldiers' Civil Re-establishment, covering the period from May, 1918, to December 31, 1919. This report does not attempt to detail the work which has been accomplished, nor to show the remarkable growth and development of the activities of the department, as such a statement would be too voluminous. It, however, shows a large increase in the responsibilities of the department, and also the position as at the date of the report.

2. Separate statements are included, prepared by the heads of the various branches —Medical Services by the Director of Medical Services—the Orthopædic and Surgical Appliances Branch by the Director of that branch—Vocational Training by the Director of Vocational Training in collaboration with the former director, Mr. W. E. Segsworth, M.E.,—the Information and Service Branch by the Director of that branch —the Chief Inspector's Branch by the Chief Inspector—the Accounting Branch, Supplies and Equipment and Purchasing Branches by the Supervisor of Expenditures and heads of these branches.

3. The magnitude of the work will be recognized when the following figures are considered:—

Number of hospitals and sanatoria directly operated by the Department	44
Number of hospitals and sanatoria partially operated by the Department	6
Number of hospitals with which the Department has agreements for a certain number of beds	74
Number of inpatients on the strength of the Department	6,520
Number of outpatients on the strength of the Department	1,634
Average number of outside clinic treatments per week during December, 1919	8,993
Number of men on the strength of the Department for Vocational Training, as at December 31, 1919	27,602
Number of men undergoing training in Curative Workshops as at December 31, 1919	3,988
Number of men receiving training in schools operated by the Department and in outside schools week ending December 27, 1919	12,327
Number of men receiving training in industries, week ending December 27, 1919	11,223

Of the foregoing total of vocational students 20,107 are disabled men and 7,495 enlisted under the military age of 18 years.

As regards employment, the Information and Service Branch received 114,728 net applications since its inception early in the year up to the 27th December, and of these 106,061 were placed in employment being a net percentage of 92·4. In the Professional and Business Section 3,496 applications were received and there were 2,717 placements, being a net percentage of 77·6. The number of inquiries dealt with by the Information and Service Branch was 762,322.

4. Attached to the report are certain appendices, some of which require special mention. Appendices 1, 2 and 3 deal with the arrangements which I had the honour to negotiate last summer with the Imperial authorities. The agreement made, which was subsequently approved by His Excellency the Governor General in Council, has been implemented by the Imperial authorities with the exception of the section providing that allowances at Canadian rates should be payable to ex-members of the Imperial Forces of commissioned rank who are undergoing treatment or training in Canada. These ex-officers are only receiving the British rates of allowances, but there has not yet been a final decision in the matter, and it is hoped that the British Treasury will agree to the carrying out of the arrangement as made with the Ministry of Pensions.

5. Another aspect of the agreement may require some modification, namely, that referring to the provision of artificial appliances to ex-members of the Canadian Forces in the United Kingdom. The Deputy Minister and the Director of the Orthopædic and Surgical Appliances Branch are visiting England and will take up the question of establishing a branch of the department's factory in London.

6. The report of Messrs. W. E. Segsworth and T. A. Stevenson (Appendix 4), conveys most valuable information as to the work of vocational training in the United Kingdom and shows that the record made in Canada compares most favourably with that of the United Kingdom.

7. Acting on your instructions I had the honour to negotiate an agreement (Appendix 5) with the Government of the United States for reciprocal arrangements regarding the treatment of ex-members of Canadian and United States Forces when resident in the country of the other. This agreement became effective by the passing of a Bill in the United States Congress which was signed on the 24th December, 1919.

8. During the period covered by this report, and particularly within recent months, a large number of hospitals, which previously were operated by the Military Hospitals Commission and were transferred to the Department of Militia and Defence from the 1st April, 1918, have been re-transferred to this Department so that there has been a large increase in the responsibility of the Department in respect of hospital management, with a consequent increase in staff. While this shows in the expenditure of the Department it, to a large extent, is a transfer of expenses from the Department of Militia and Defence.

9. During the last session of Parliament various recommendations were made which have since been embodied in Orders in Council, copies of which appear in the appendices to this report. At that session a sum of money was voted to be utilized in assisting ex-members of the Forces who are out of employment during the present winter. The responsibility for handling this appropriation has been vested in the Canadian Patriotic Fund. The Information and Service Branch of this Department is working in close co-operation with the local committees of the Fund and representatives of this Branch are responsible for the issuing of certificates entitling applicants to assistance.

I have the honour to be, sir,
Your obedient servant,

E. H. SCAMMELL,
Assistant Deputy Minister and Secretary.

Ottawa, December 31, 1919.

SOLDIERS' CIVIL RE-ESTABLISHMENT.

The organization of the Department of Soldiers' Civil Re-Establishment broadly resolves itself into:—

1. General administration under the Deputy Minister.
2. Personal services to the ex-soldier undergoing treatment or training, such as pay records, clothing, leave, dependent's interests, discipline, under a Chief Inspector.
3. Medical services under a Director of Medical Services.
4. Manufacture and maintenance of artificial limbs and appliances, under a Director of the Orthopædic and Surgical Appliances Branch.
5. Ward occupations, enrative workshops, and industrial re-training under a Director of Vocational Training.
6. Placement of both the disabled and demobilized members of the Forces in touch with opportunities for employment, under a Director of Information and Service.

The general organization of the Department consists of headquarters at Ottawa and ten principal Units, corresponding with the Military Districts of the Department of Militia and Defence.

The executive personnel at the Head Office is as follows: Deputy Minister, Assistant Deputy Minister and Secretary, Director of Vocational Training, Director of Medical Services, Director of Information and Service, Chief Inspector, General Superintendent of Engineering Branch, Supervisor of Expenditures, Director of Dental Services, Director of Mechanical Transport, with heads of sub-branches, General Organizing Dietitian, Superintendent of Supplies and Equipment, and Chief Accountant. The Director of the Orthopædic and Surgical Appliances Branch has his headquarters at Toronto.

Each unit is officered by an Assistant Director, a Unit Medical Director, a District Vocational Officer and a Unit Service Officer, with their necessary assistants. The following are the locations of the Units:—

Unit.	Headquarters.	Sub-headquarters.
Quebec	Montreal, P.Q.	Quebec, P.Q.
Nova Scotia and Prince Edward Island.	Halifax, N.S.	Sydney, C.B. Charlottetown, P.E.I.
Eastern Ontario.	Kingston, Ont.	Ottawa, Ont.
Central Ontario.	Toronto, Ont.	Hamilton, Ont.
Western Ontario.	Guelph, Ont.	London, Ont.
Manitoba.	Winnipeg, Man.	Pt. Arthur, Ont.
Saskatchewan.	Regina, Sask.	Saskatoon, Sask.
Alberta.	Calgary, Alta.	Edmonton, Alta.
British Columbia.	Vancouver, B.C.	Victoria, B.C.
New Brunswick.	Fredericton, N.B.	St. John, N.B.
Yukon Territory.	Dawson City.	

The number on the staff at the head office and units, including hospital staff, at the 31st December, 1919, was 8,121, made up as follows:—

		Per cent.
Returned soldiers who have seen service in France	3,766	46·4
Returned soldiers who have seen service in England	468	5·8
Returned soldiers who have seen service in Canada	277	3·4
Rejected or exempted	91	1·1
Boys under and men over military age	463	5·7
Male civilians	205	2·5
Women and girls	2,820	34·7
[1]Unclassified	31	0·4
Total	8,121	100·0

[1]A proportion of the unclassified are returned soldiers.

Of the total staff, 4,511 or 55·5 per cent have served with the forces. Eliminating from the male staff the exempted or rejected, over age or under age, 95 per cent have served with the C.E.F. Of these, 83·5 per cent have served in France, 10·4 per cent in England, and 6·1 per cent in Canada.

PAY AND ALLOWANCES.

It was early recognized that if men were to be re-trained for new occupations or if they were to be given periods of treatment in hospital after discharge from the Army or Navy, a scale of pay and allowances would have to be authorized in order that the men themselves and their dependents might be properly maintained. The first scale was drawn up and approved by Privy Council in June, 1916. Owing to the increased cost of living and to other changes it has been necessary to extend the rates as originally arranged. The latest changes took effect in February, 1919, when an Order in Council was passed (P.C. 387), which provided the following rates:—

1. Men undergoing treatment:—

Pay of rank at time of retirement or discharge, plus the following allowances in lieu of Patriotic Fund Allowances for dependent or dependents of the former members of the Forces who held a rank below commissioned rank:—

Wife only	$10 00
" and one child	19 00
" " two children	26 00
" " three children	31 00

For each child in excess of three, $5 per month, with a maximum allowance of $45 per month for wife and children.

2. Men undergoing training:—

Man without dependents	$60 00
" with wife	85 00
One child	10 00
Two children	18 00
Three children	25 00

For all children in excess of three, $6 per month for each child.

Widower with one child	$80 00
" " two children	88 00
" " three children	95 00

For each child in excess of three, $6 per month.

Allowances are also granted for dependent parents and brothers and sisters. Provision is made for payment of additional expenses when it is necessary for men to live away from home in order to receive their training, and for deduction when they are subsisted at a public institution.

The development of the work of the department to its present magnitude has been a gradual evolution. Through the medium of Orders in Council it has been possible, as new problems have presented themselves and new and unexpected situations have arisen, to provide machinery whereby the problems could be solved and the situations met. The work has been without precedent, and there has been on the part of the staff and officers of the department a whole-hearted desire to give to the returned soldier the best service in their power and to meet his needs in a way which would reflect the desire of the people of Canada in his behalf.

SESSIONAL PAPER No. 14

REPORT ON MEDICAL SERVICES.

(Submitted by Dr. E. G. Davis, C.M.G., M.D., Director of Medical Services.)

FUNCTION.

The Medical Branch of the Department of Soldiers' Civil Re-Establishment deals with the medical and surgical care of the returned soldier after discharge from the army. Let us divide the work into classifications, for purposes of explanation. The department cares for:—

(*a*) Those patients transferred as patients direct from the Department of Militia and Defence, i.e., before discharge from the army the men are medically cared for by the C.A.M.C., who bring the case to completion of treatment if such case is to be of short duration; but if the illness will be of long duration the patient is discharged from the army and transferred to S.C.R. care.

(*b*) Cases already discharged from the army but having recurrences of a disability due to or aggravated by service.

(*c*) The medical care of all ex-soldiers for one year after discharge from the army (or from the S.C.R. if they were direct transfers from C.A.M.C. to S.C.R.) for any unpreventable illness not caused by service.

(*d*) Medical care of men undergoing industrial training.

(*e*) Medical care of all ex-members of Imperial or Allied Forces in Canada.

(*f*) Provision of all specialists' reports required on re-examination of pensioners.

Class (*c*) does not receive pay and allowances while under treatment, but classes (*a*) and (*b*) do, according to the time incapacitated for employment.

Patients may be classified in other ways,-such as according to the nature of disease or ailment, for example: Wounds, general diseases, tuberculosis, insanity, feeble-mindedness, epileptics, neurological, orthopædic, dental, venereal, etc.

Or again, patients may be divided according to the amount of incapacity for employment in conjunction with treatment, for example:—

(*a*) *In-patients.*—Those requiring care in S.C.R. or allied institutions.

(*b*) *Out-patients Class I.*—Those not requiring hospital care, and yet unable to attend to any employment while under treatment.

(*c*) *Out-patients Class II.*—Those requiring treatment, but able to attend to employment other than during the hours of attendance for treatment.

ORGANIZATION OF MEDICAL BRANCH.

In the general head office at Ottawa there is, in co-operation with the other branches, the head office of the Medical Branch, consisting of the Director of Medical Services and staff.

In each unit there is suitably located a Unit Central Office, part of which is medical, consisting of a Unit Medical Director and staff. Also in the unit are the necessary medical staffs for clinics, hospitals, sanatoria, dispensaries, etc. At the outside places throughout all parts of Canada, medical representatives have been appointed in towns and villages, so that patients will have quick and easy access to them, and avoid expense of transportation and annoyance to the patient. These medical representatives are paid according to schedule of fees laid down, and only for the actual work done. There exists a system for authorization, reports, records, etc.

Doctors are employed under three headings, according to the work involved: Full-time, part time, and on schedule of fees.

Patients are treated, whenever possible, near their homes, or may be transferred to a centre for their benefit, to be attended by more expert care, or to a hospital or sanatorium because of the nature of the case and availability of such accommodation.

GENERAL STATEMENT OF THE WORK.

The vast importance of the medical services of the D.S.C.R. must be apparent to all. They are effectually grappling with the work, many features of which were new and unprecedented to the present time, and it may be said without fear of contradiction, that the provisions made by the Canadian Government are more liberal and effective than are those of the Allied countries.

The growth and activities of the medical branch have been tremendous. In June, 1918, the number of patients cared for was 1,200, and the patient strength on December 31, 1919, was 8,031. Also it may be noted that in addition an enormous number of out-patient treatments were given. Between May 1, 1919, and January 1, 1920, these treatments amounted to 126,057. This figure represents only a small portion of the amount of medical work, including medical reports, expert advice, special examinations, B.P.C. examinations, reports, etc., interviews, personal and otherwise, which of necessity follows when dealing with such large numbers of men and their relatives, scattered over this great Dominion and having many varied viewpoints and requests.

COMPOSITION OF PERSONNEL.

It is the policy of the department to employ doctors, nurses, and medical orderlies similarly as in the other branches; that is, those with overseas experience, and preferably those of previous local residence. It must be stated that great difficulty was experienced in this respect in the earlier days, as such overseas staff could not be spared from the C.A.M.C., and in places non-overseas staff had necessarily to be secured; but these have been steadily and gradually replaced when suitable overseas personnel became available. Also, in certain towns and villages it may never be possible to employ overseas men, as such medical men may not be resident there.

HOSPITALS.

The medical services are conducted with the chief aim of efficiency in the treatment of the patient, and in his best interest, and yet with due consideration to economy; and it is desired that there should be no over-lapping of hospitals with the military or civil authorities. It was not considered advisable to establish a double chain of general hospitals from coast to coast, duplicating those of the Department of Militia and Defence, as this would have involved both a waste of public money and a waste of medical officers and nurses. For this reason, with the exception of the sanatoria for the treatment of tuberculosis, hospitals for long-treatment cases, and clinics and dispensaries, wherever there was accommodation or the plan was feasible, it was decided that the military hospitals should be utilized for the treatment of ex-soldier patients on the strength of this department. In towns or cities where there are no military hospitals, or when the patient is too ill to be moved to such hospitals, he is treated in the civil hospital nearest to his home. This arrangement is of material advantage to the patient as well as economical to the country as a whole. It obviates the necessity of furnishing transportation for long distances, and at the same time shortens the length of time during which the patient is away from his work. Exception is made in connection with orthopædic and neurological cases, where there are certain definite medical centres where the best specialists (physicians and surgeons) are available. In general these cases are transferred to such centres.

Appended is a list of hospitals and sanatoria which are operated by the Department with the situation of each and the number of patient beds. Also a list of other hospitals, not under control of this department, but offering a definite number of beds for Soldiers Civil Re-Establishment cases.

The present Soldiers' Civil Re-Establishment accommodation is practically occupied, and it is anticipated that a peakload of patients will be arrived at during this

winter. The department would not have been justified in establishing more hospitals in the fall of 1919, because it was anticipated and desired that certain suitable institutions, then occupied by the Department of Militia and Defence for hospital purposes would be handed over for Soldiers' Civil Re-Establishment use because of the fact that they would not be required by the Department of Militia and Defence. This arrangement has recently been effected.

TREATMENT OF CASES OF TUBERCULOSIS.

Soldiers who develop tuberculosis while on service, and who are returned to Canada for further treatment, immediately upon diagnosis are transferred by the military authorities to the Department of Soldiers' Civil Re-Establishment, and are sent to one of the various sanatoria under the direction of this department.

The total number of cases of tuberculosis which have been treated up to the present is approximatively 7,000. Less than 5 per cent of these cases have died; about 20 per cent have become arrested; about 25 per cent have become quiescent; a large proportion of the balance have improved more or less; a small proportion have left institutions of their own accord and have refused further treatment, for family or other personal reasons. Records show that 75 per cent of those ex-members of the forces who have fallen a prey to the disease, and who have been treated in sanatoria of this department, are able to resume useful occupations in civil life.

About one year after the commencement of hostilities, the Military Hospital Commission, from which the Department of Soldiers' Civil Re-Establishment has evolved, undertook the medical care of soldiers suffering from pulmonary tuberculosis. At that time (August, 1915), the sanatoria throughout Canada for the most part were very small, and were inadequate to meet the needs of the war situation. With the thorough medical examination of recruits, soldiers in Canada and soldiers who had done service overseas, splendid results were obtained in the early diagnosis of this disease. There is no doubt that in civilian life thousands of cases of this disease which have been discovered in the army, would not have been subjected to medical examination until the disease was far advanced, and with little prospect of cure. It became evident, as the numbers of cases of this disease in the army were discovered, that much more extensive provision for their accommodation and treatment would have to be made than had existed in pre-war days.

To secure accommodation urgently required, arrangements were made throughout Canada for the use of portions of existing sanatoria. In some cases necessary extensions to these institutions were made, the department sharing in the capital cost thereof. In other cases arrangements were made, either with Provincial Governments or societies interested in the care and treatment of tuberculosis, whereby new sanatoria were built, the capital cost of which was shared with the department. This policy reduced enormously the capital expenditure which would otherwise have been necessary by the department, and greatly increased throughout Canada the facilities for combating the spread of tuberculosis generally amongst the civil population.

After the present emergency with respect to the treatment of tuberculous ex-members of the Forces has passed, these increased facilities will be available towards effectively stamping out the scourge of tuberculosis in this country.

In every sanatorium where patients of the department are treated, the high standard set by the department as to quality of treatment, food, attendance, and general service is strictly maintained under frequent inspections by medical as well as lay representatives of the department.

At the present time (January 11, 1920) the department has 2,032 tuberculous patients under treatment in twenty-six (26) sanatoria throughout the Dominion. Twelve of these sanatoria are the property of the department, or have been leased for a term of years, and are under the control of the department. Eight of the others have been enlarged, and the accommodation vastly improved.

It was impossible in every case to build or extend sanatoria as rapidly as the needs of the situation demanded, and in some provinces hotels having a suitable situation and being easily adaptable for sanatorium purposes, were altered and improved for use as sanatoria for the treatment of cases of pulmonary tuberculosis.

The advantages of the Canadian system have been recognized and complimented on by other Allied countries.

It was early recognized that patients in sanatoria found the time dragging heavily during idle hours, and for this reason ward occupations were introduced by the Vocational Branch of the department. Such work as basket-weaving, toy-making, painting, light cabinet-making, and other useful handicraft work have been taught continuously. Instruction is also given in stenography, commercial practice, book-keeping, draftsmanship, etc. All work of this nature is subject to the advice of the Medical Superintendents of sanatoria, to ensure that the occupation which will best assist in the cure of each patient is taught to him, and to prevent the possibility of a patient being engaged in an occupation which might retard his improvement.

It is understood that other Allied nations are following the example which Canada has set, and are introducing ward occupations and vocational training in their sanatoria. There can be no doubt that ward occupations act as occupational therapy. In other words, the interest which the patient develops in his work has a beneficial effect through the mind upon the body, and actually assists in the cure of the disease. Many civilian institutions have taken advantage of the knowledge which has been gained by the department in connection with ward occupations as a curative agent, in the treatment of pulmonary tuberculosis, as well as the other forms of treatment which have been adopted, and it is quite evident that in the future this will be one of the accepted therapeutic agents in the treatment of this disease.

The work of the Department of Soldiers' Civil Re-Establishment in connection with tuberculosis has upset a number of theories which have been more or less generally accepted in connection with the treatment of pulmonary tuberculosis. For instance, it has been found that a high altitude is not necesssary in the treatment of this disease; that patients do as well in low or moderately high altitudes as in the mountains; and that proximity to a lake or the sea does not militate against the probabilities of improvement or cure.

The latter point has been amply demonstrated at the Mowat Memorial sanatorium, at Kingston, Ont., which is within half a mile of lake Ontario, and at the Nova Scotia sanatorium, at Kentville, N.S., which is within a few miles of the Atlantic ocean.

The old idea that tuberculosis was contracted in adult life has given place to later knowledge in which it has been proved, almost beyond a doubt, that tuberculosis is more often contracted in childhood, when the tissues are softer and more susceptible to the germs of the disease. The large numbers of nurses, doctors, orderlies, etc., in these sanatoria who work year by year in close contact with the patients without developing the disease, prove that the condition is not very contagious to adults under proper living conditions. On the other hand, it must be remembered that adults do break down with tuberculosis, but this is practically always a recrudescence of a condition which existed in childhood. It can be demonstrated that between 90 per cent and 95 per cent of all individuals suffer at some period during their lives from some form of tuberculosis, and the healed lesions may be found upon autopsy.

The use of the X-ray, which has been found so important in the diagnosis and the prognosis of pulmonary tuberculosis, has been developed to a very high degree, and in practically every sanatorium in Canada where ex-soldiers are being treated the department has installed the best electrical apparatus which it is possible to secure.

The greatest attention has been devoted by the Department of Soldiers' Civil Re-Establishment to the development of scientific treatment. The three great essentials of this are: good food, fresh air, and rest. Trained dietitians are placed in every sanatorium and, working under the instructions of the physician in charge, they arrange meals which are not only daintily served and appetizing, but have the greatest

caloric value and are substantial and highly nourishing. Special arrangements are made to see that every patient gets his food served hot; and fruits, fresh meats, eggs, milk, cream, and everything essential are served in all sanatoria.

In order that the fresh-air treatment may be properly carried out, pavilions are built in such a manner that patients sleep and rest practically in the open air, and without any artificial heat, on the balconies. On the other hand, the corridors of each pavilion, and the wash-rooms and dressing-rooms for each patient, are well heated, so that when a patient has to leave his bed during either the day or the night, he may pass at once into a properly heated atmosphere.

Pensions.—In order to obviate the necessity, for financial reasons, of patients on discharge from sanatoria going straight into employment which requires a full day's work—and this after a prolonged period of rest—an arrangement has been made with the Board of Pension Commissioners whereby apparently arrested and quiescent cases of tuberculosis which are released from sanatoria shall receive a pension of 100 per cent for the first six months. This will enable patients to get back gradually into the swing of civil life and, by shortening their daily resting time, bit by bit, will lessen the danger of a relapse, besides placing them in a financial position which means peace of mind and, therefore, physical improvement.

Ex-soldiers who have suffered from pulmonary tuberculosis, and in whom the disease has been arrested, may not be able to return to their former occupations owing to the danger of relapse, but in such cases arrangements are made by the Vocational Branch to see that they are taught an occupation which is consistent with their changed physical condition. In this way a great advance has been made towards maintaining the patients in good health after the disease has been arrested.

The department has secured some of the most competent specialists in the treatment of tuberculosis in Canada, and ex-soldier patients receive every possible care under the most beneficial conditions, as is demonstrated by the results.

TREATMENT OF THE INSANE.

The policy hitherto followed has been to carry out the treatment of ex-soldiers suffering with mental disabilities, particularly those of a permanent nature, in the various provincial hospitals for the insane throughout the Dominion. As far as practicable, mental cases discharged from the army for further treatment are admitted first to a clearing hospital operated by the department at Newmarket, Ont. (161 beds). Many patients on discharge from this hospital have recovered or are sufficiently improved to be able to go to their homes, thus avoiding the necessity of transfer to a provincial institution.

The hospital at Newmarket has been in operation since the autumn of 1917, and for the most part only the severer mental cases have been sent there. Bearing this fact in mind, it is gratifying to note that during 1918 approximately one-third of the patients discharged from this hospital were either recovered or so far improved as to be suitable to return to their homes.

In some quarters a sentiment has existed against the reception of mentally disordered soldiers into the provincial hospitals for the insane. It is felt that this sentiment cannot altogether be defended. Many of these institutions are excellent, the buildings modern and comfortable, well-equipped and well-kept. It is true that not all the provincial hospitals are of equal merit, and in certain of the older ones suitable accommodation may not be readily available.

In most of the provinces, accommodation for mental patients is very limited, and quite generally extensions are either being provided or in prospect. Particularly in the province of Ontario has the need of increased accommodation been felt, largely owing to the fact that the provincial authorities have given generously of accommodation intended for this purpose to provide buildings urgently needed for other classes of

ex-soldier patients. To meet this need and to provide for the cases still returning from overseas, the Westminster Military Hospital at London, Ont., the erection of which has been commenced, was recently taken over by the Department of Soldiers' Civil Re-Establishment, and is now being converted into a mental hospital of about 460 beds. It is intended that this institution shall embody in accommodation, equipment, and treatment facilities, all the essentials of the modern psychiatric clinic. Special emphasis is being laid upon the comfort of the patients, their dietary needs, suitable ward classification and segregation, hydro-therapy and other special treatment methods, separate provision for tuberculous cases, recreational advantages, and extensive occupational therapy. Here it is proposed that ex-soldiers suffering from mental diseases shall be given such care and treatment as will ensure the best possible hopes of recovery. Forty additional acres have been taken over by the department in connection with this institution, as farm land for purposes of occupational therapy.

It is to be borne in mind that well over 50 per cent of the cases of actual mental disease or defect among discharged men belong to the permanent or chronic type, and are similar in every respect to the mental disabilities prevalent among the population of asylums generally. Where recovery is not to be expected, efforts are directed toward such conservation of mental capacity as may be possible. Many patients are thus prevented from deteriorating completely; and by means of occupation and manual training, others, especially the higher defectives, may make great improvement.

The department has appointed an expert psychiatrist as inspector of mental hospitals for the department, who, after inspecting each mental institution in Canada where patients of this department are being cared for, is making suggestions for improvement where same is necessary. These suggestions are being taken up with the various provincial governments concerned.

LONG-TREATMENT CASES AND INCURABLES.

Fortunately, owing largely to the work of occupational therapy and ward occupations, which have been so highly developed during the present war, particularly in Canada, which led the way in this work, the number of ex-members of the forces considered as incurable or completely disabled has been kept down to a minimum. While there is no doubt that another year will reveal a larger proportion of such cases, up to the present it is satisfactory to know that a very small number (other than those suffering from insanity and tuberculosis) have developed amongst those ex-members of the forces returned to Canada for further treatment.

The department operates institutions for these men, one at Euclid Hall, Toronto; one at Montreal, Mount Royal Hospital, and one at Victoria, B.C., Craigdarroch Hospital. The patients in these institutions are mostly men who, for example, have been shot through the spinal column and are partly or completely paralyzed. A large staff of nurses and occupational-therapy workers gives them constant care, and in a recent inspection the men, in spite of their unfortunate condition, seemed happy and contented.

It is interesting to note that a not inconsiderable proportion of those ordinarly classed as "incurable" respond satisfactorily to occupational treatment, even though such treatment must be carried out in conjunction with other medical or surgical treatment over a very long period.

It is considered that all the efforts of the Vocational and Medical Branches of the department in these cases are amply rewarded by the results. Perseverance in treatment towards cure in these hospitals for long treatment is considered preferable to placing patients ordinarily classed as "incurable" in homes for incurables to await tediously the end of their lives, rendered inactive by war service.

It has become evident that other hospitals for long treatment will have to be established in other parts of Canada. It is kept in mind that as the amount of active-treat-

ment work diminishes in a few years to come, more provision will have to be made for long-standing cases; and in selecting sites of our present accommodation, this point is kept in view, so that such accommodation may be utilized in the future advantageously for these long-standing cases.

EPILEPTICS, FEEBLE-MINDED AND PROBLEM CASES.

It was thought that it might be necessary to establish provision in both Eastern and Western Canada for permanent care of epileptics, feeble-minded, and similar cases. However, it is realized that these men cannot be forcibly put in these institutions, and even if persuaded to enter some establishment such as a colony, might remain there but a few days and wish to return to their friends.

Effort was made on recent occasion to locate any cases of epileptics after discharge from the army, to communicate with them and to see what proportion would be willing or desirous of entering institutions for their care; also to find out the number and frequency of fits and the amount of disability. The results were very unsatisfactory, but few patients even answering the correspondence, and a very small percentage were even willing, though not desirous of taking such treatment.

It is considered, nevertheless, that certain provision will have to be made for feeble-minded, or cases of low-mentality, and in the new Psychiatric Hospital at London, Ont., accommodation will be set aside for this type of case. It would be impossible to estimate the numbers that will avail themselves of this advantage, and only time will tell. It is probable that accommodation will be secured in both Eastern and Western Canada in the same manner as in southern Ontario, but it is not the desire of this department to over-estimate the necessary provisions and expenditures in this respect, but provision is being made as is found necessary. It must be remembered in this connection that only those in this class who voluntarily submit to treatment can be cared for in these proposed treatment centres.

ORTHOPÆDIC CASES.

A factory for the manufacture of artificial limbs and appliances has been established at Toronto, and there has been a very rapid development in the type of artificial limbs and appliances, based partly upon the experiences of the manufacturers overseas and in America, and partly upon original research at the factory. In this work Lieut.-Col. Clarence L. Starr, the chief orthopædic consultant for the Department of Militia and Defence, has given valuable assistance.

It is not desired to occupy space with details regarding the actual appliances and their manufacture, for in this matter Major Coulthard, Director of the Orthopædic and Surgical Applianaces Branch, will be in a better position to explain.

It has been found that the best method in connection with artificial limbs is to give the patient a peg leg to wear until the stump has properly shrunk. A good deal of the dissatisfaction which occurred in the early years of the war was due to the fact that artificial limbs were made and fitted before the stump had properly shrunk, the result being that when the stump had assumed its permanent size and shape, the artificial limb no longer fitted it. This has been largely obviated by the supplying of temporary peg-legs.

The system by which men secure artificial limbs or surgical appliances throughout the various provinces, is by direct application to the medical director of the unit concerned, who, after examination, issues a prescription for the required appliance. The patient is then sent to the fitting room where the fitter receives instructions as to what is necessary, and completes the apparatus, which is afterwards inspected by the orthopædic surgeon of the unit, to see that the appliance is satisfactory. When men live at a distance from these fitting depots, they are given transportation and necessary expenses while travelling to and from the fitting centres.

An orthopædic surgeon has been appointed in connection with the Medical Branch to do duty at the factory in Toronto, not only to assist with suggestions for improvement in appliances, but to examine all cases that report for appliances, and see that they get suitable apparatus. In addition to this he teaches the medical men from the other provinces who are sent to Toronto for instruction in this new and most necessary work.

Over 90 per cent of the members of the Canadian Forces who require artificial limbs have been satisfactorily fitted with appliances manufactured in the factories of the department. Amputation cases totalling over three thousand have been fitted with artificial limbs; special orthopædic boots to the extent of over four thousand pairs have been provided, and a grand total of about fourteen thousand amputation and orthopædic cases have received attention regarding their requirements.

TREATMENT OF VENEREAL DISEASES.

It became increasingly evident, for the protection of the public, for the individual ex-soldiers concerned, and for the sake of the future of Canada, that men suffering from venereal diseases, contracted during or previous to war service, when requiring further attention, should receive it under the care of this department. It was a fair presumption that any soldier whose condition was quiescent previous to enlistment, enlisted in good faith; and that any soldier who contracted the disease during service, and took the necessary treatment in order to refit himself for the firing line, was deserving of further consideration. There is no doubt that conditions such as these, which might have remained quiescent for many years, or for a life-time during a quiet and uneventful civil career, might easily be rekindled during the excitement, rough life, and strain incident to the battle line. For these reasons it was considered that such patients should be given treatment where the condition was evidently a recurrence, and not contracted since discharge.

DENTAL TREATMENT.

A Director of Dental Services for the department has recently been appointed.

The policy of the Department of Soldiers' Civil Re-Establishment is to give dental treatment, either by dentists on the staff of the department or by special arrangement with civilian dentists at outside points to ex-soldiers who are,—

(1) On the strength of the Department of Soldiers' Civil Re-Establishment either for medical treatment or as students for vocational training.

(2) Such cases as require dental treatment for repair of direct damage to the jaw or teeth resulting from war service, and this class will include cases of recurrence of infected mouth due to service, which require treatment for a toxic systemic condition, if the medical examiner finds the general condition due to the recurrence of oral infection.

(3) Cases referred by the Board of Pension Commissioners where dental care is necessary to lower pensionable disability.

The first class, being under medical treatment or vocational training, is on the strength of the department, and should receive dental treatment, when it is indicated by the medical officer of the unit that dental treatment will improve the general condition. Men in this class will not receive pay and allowances other than those they are entitled to as being on strength for vocational training or medical treatment.

The second class, namely, those requiring dental treatment for direct damage to jaw or teeth due to service, and which should be considered in the same manner as physical disability receives either full pay and allowances, or is taken on the strength as an out-patient, Class 2, and granted allowances for the time lost in attending for treatment according to the circumstances of the case.

The third class—Only those actually losing time from work should receive allowances, according to the actual time lost, as in the case of physical disabilities.

SOCIAL SERVICE WORKERS.

An outside nursing service is in operation for the purpose of tracing up such cases as have been discharged from the hospitals, with a view to determining whether their home treatment which has been prescribed is being properly carried out, and that the conditions under which the patients are living are conducive to their improvement. It became apparent that the Social Service System has a definite place in the organization of the various units of this department, and it has been decided that for this form of work the services of trained nurses would be utilized.

The objects of this work are as follows:—

(*a*) The following up of cases of tuberculosis on leave from sanatoria, to see that they are taking proper care of themselves, i.e., taking the rest which has been prescribed; that their habits are conducive to good health, and also to see that their housing and environment are helpful to their cure. In connection with house visits the Social Service worker may, by interviews with the wives or families of patients, secure not only assistance in following up the cases, but intelligent co-operation toward the cure. If a recurrence of the disease has supervened, the medical officer may be thus warned in time to return the patients to sanatoria.

(*b*) The following up of mental cases *on probation,* to see that their habits are temperate and not likely to interfere with their mental condition. To report any recurrence of symptoms, and to advise the wives or immediate families of the patients regarding the necessary rules and care which need to be followed.

(*c*) The following up of *class 1 out-patients* to see that they are not working and thus militating against a quick recovery, that their habits are temperate, etc.

(*d*) To investigate the circumstances regarding the dependents of ex-soldiers, to see that the number of dependents claimed actually exists.

(*e*) To secure any confidential information which may be desired by the Assistant Director, the representative of the Information and Service Branch, the District Vocational Officer, or the Unit Medical Director.

(*f*) To act as advisers to the wives and families of ex-soldiers, who need home encouragement to assist them in holding their employment.

(*g*) To carry out any nursing or observatory duties with reference to ex-soldiers, which the Unit Medical Director may require.

Cases of distress, of financial hardship, or medical emergency have precedence in investigation over all other cases.

TREATMENT OF EX-IMPERIAL SOLDIERS IN CANADA, OF EX-UNITED STATES SOLDIERS IN CANADA, AND OF EX-CANADIAN SOLDIERS IN GREAT BRITAIN AND THE UNITED STATES.

By mutual arrangements between the Imperial, United States, Newfoundland, and Canadian Governments, provision has been made whereby ex-soldiers of the one country, receive treatment for disabilities due to war service, in the other country when resident there.

"MEDICAL QUARTERLY," S.C.R.

Medical work in connection with the civil re-establishment of ex-soldiers is rapidly assuming a broad and comprehensive character; not only in the treatment of the tubercular, the insane, the epileptic, incurable and chronic cases, but with that much more numerous class of cases included under the general term "recurrence of war disabilities." For this reason, and in order that those physicians and surgeons

employed by the department, as well as the medical profession generally, may be thoroughly familiar with the latest methods of treatment in connection with the various post bellum medical problems, the Department of Soldiers' Civil Re-Establishment has inaugurated a "Medical Quarterly," issued jointly by the Department and the Board of Pension Commissioners.

This "Medical Quarterly" is available to all physicians, surgeons, organizations, and institutions interested in the work of rehabilitation of the ex-soldier, and upon application to the department the names of such are entered upon the regular mailing list for this publication. The first number was published on January 1, 1919.

It is hoped that this publication will present an opportunity which will be taken advantage of by the profession for the dissemination of medical knowledge of a general nature as applied to the rehabilitation of the ex-soldier, not only as if affects his physical condition, but his mental attitude toward social and economic life. All physicians and surgeons, whether employed by the department or not, who have anything of interest to record in connection with the treatment and after-care of ex-soldiers, are invited to contribute to this quarterly in order that there may be free interchange of information which will not only be beneficial to the ex-soldier of the present war and the public generally, but, to a certain extent, will act as a permanent record for the use of future generations.

GENERAL.

The policy of the department has not been to secure only the services of those who have done overseas duty with the Canadian Expeditionary Force, but to see that the very best physicians and surgeons available are employed. Such a policy is not only of the utmost importance to the welfare of the individual ex-member of the forces, but will be of ultimate economic value to Canada. Proper medical, physiotherapeutic, and re-educative treatment will inevitably avoid the distressing and unfair social calamity which has followed former wars in all countries, i.e, the pauperization of disabled soldiers.

It is interesting and very gratifying to know that with the present system of medical treatment, followed as it has been by occupational therapy and industrial re-training, the prospective number of dependents upon public funds or upon private charity will be reduced to a minimum.

The work of the Department of Soldiers' Civil Re-Establishment is still in a transitional stage, and progress must naturally be that of evolution. The conditions and problems which arise from day to day have had no precedent in the history of the world, and must be grappled with one by one as they arise. In spite of this the development of the entire department has been progressive and rapid.

The medical problems, as well as all other problems connected with the ex-soldier, are being solved as rapidly as is consistent with efficiency and the welfare of the individual. It is hoped that the ex-soldier and the public generally will appreciate the difficulties and continue in their sympathetic and co-operative attitude towards those who are striving to restore natural conditions throughout the Dominion.

The Medical Branch of the department has had a gigantic work, and is effectively grappling with it, and when the ex-soldier finally regains health and strength, as far as it is possible for modern science to restore it, he will once more be in a position to resume responsible citizenship with all its privileges and duties.

SESSIONAL PAPER No. 14

(TABLE A). INSTITUTIONS OPERATED BY S.C.R.

I General Treatment Hospitals

Unit.	Name.	Place.	Total No. of Patient Beds.
"A"	Prince of Wales Hospital	Montreal, Que.	250
	Mount Royal Hospital	"	35
	Ste. Annes Hospital	Ste. Anne de Bellevue, Que	500
	Dorchester Hospital	Montreal, Que.	35
'B"	Rena McLean Memorial Hospital	Charlottetown, P.E.I.	141
	Moxham Hospital	Sydney, C.B.	70
	Camp Hill Hospital	Halifax, N.S.	165
"C"	Calderwood Hospital	Kingston, Ont.	18
	Sydenham Hospital	"	150
	Sir Sandford Fleming Hospital	Ottawa, Ont	60
"D"	Euclid Hall Hospital	Toronto, Ont.	36
	Davisville Hospital	"	425
	Spadina Hospital	"	69
	College Street Hospital	"	125
	Brant House	Burlington, Ont	400
	Hut Hospital	Hamilton, Ont	20
"F"	Speedwell Hospital (active)	Guelph, Ont.	295
	Erie Hospital	London, Ont.	67
"G"	Deer Lodge Hospital	Winnipeg, Man.	66
"H"	Earl Grey Hospital	Regina, Sask.	64
"I"	Strathcona Hospital	Strathcona, Alta	148
	Sunnyside Hospital	Calgary, Alta	42
	Col. Belcher Hospital	"	150
	South Edmonton Hospital	Edmonton, Alta	123
"J"	Victoria Hospital	Victoria, B.C.	110
	Fairmont Hospital	Vancouver, B.C.	150
	Esquimalt Hospital	Victoria,	156
"K"	Lancaster Hospital	St. John, N.B.	55
	Fredricton Hospital	Fredericton, N.B	100

II. T. B. Sanatoria.

Unit.	Name.	Place.	Total No. of patient Beds.
"A"	Laurentian Sanatorium and Laurentide Inn	St. Agathe des Monts, Que	266
	Lake Edward Sanatorium	Lake Edward, Que	60
	Belmont Hospital	Montreal, Que.	50
"B"	Dalton Sanatorium	North Wiltshire, P.E.I.	75
"C"	Sir Oliver Mowat Memorial Sanatorium	Kingston, Ont.	173
"F"	Speedwell Hospital (T.B.)	Guelph, Ont.	166
	Freeport Sanatorium	Freeport, Ont.	62
"I"	Frank Sanatorium	Frank, Alta.	60
	Wetaskiwin Sanatorium	Wetaskiwin, Alta	40
"J"	Balfour Sanatorium	Balfour, B.C.	97
"K"	Jordan Memorial Sanatorium	River Glade, N.B.	78

III. Mental Hospitals.

"D"	Newmarket Hospital	Newmarket, Ont.	163
"F"	Westminster Hospital	London, Ont.	430

TABLE (B).—INSTITUTIONS, OTHER THAN S.C.R., WHERE DEPARTMENT HAS DEFINITE ARRANGEMENTS FOR ACCOMMODATION.

I. General Treatment Hospitals.

Name.	Place.	No. of Beds.
Montreal General Hospital	Montreal, P.Q.	
Royal Victoria Hospital	Montreal, P.Q.	150
Jeffrey Hale Hospital	Quebec, P.Q.	30
Hotel Dieu Hospital	Kingston, Ont.	11
St. Luke's Hospital	Ottawa, Ont.	48
Protestant General Hospital	Ottawa, Ont.	24
Mount Hamilton Hospital	Hamilton, Ont.	25
Toronto General Hospital	Toronto, Ont.	14
Guelph General Hospital	Guelph, Ont.	35
Hotel Dieu Hospital	Windsor, Ont.	30
Winnipeg General Hospital	Winnipeg, Man.	81
St. Paul's Hospital	Sakatoon, Sask.	15
Saskatoon City Hospital	Saskatoon, Sask.	14
Calgary General Hospital	Calgary, Alta.	42
Royal Inland Hospital	Kamloops, B.C.	40
General Hospital	Vancouver, B.C.	280

II. T.B. SANATORIA.

Nova Scotia Sanatorium	Kentville, N.S.	265
Lady Grey Sanatorium	Ottawa, Ont.	7
Mountain Sanatorium	Hamilton, Ont.	125
Muskoka Cottage Sanatorium	Gravenhurst, Ont	45
Calydor Sanatorium	Gravenhurst, Ont.	8
Queen Alexandra Sanatorium	London, Ont.	223
Manitoba Provincial Sanatorium	Ninette, Man.	100
King Edward Sanatorium	Winnipeg, Man.	3
Saskatchewan Provincial Sanatorium	Fort Qu'Appelle, Sask.	150
Mount View Sanatorium	Calgary, Alta.	18
Tranquille Sanatorium	Tranquille, B.C.	128
St. John County Hospital	East St. John, N.B.	49

III. INSANE INSTITUTIONS.

Nova Scotia Hospital	Dartmouth, N.S.	45
New Brunswick Hospital	Fairville, N.B.	21
Beauport Hospital	Beauport, P.Q.	18
St. Jean de Dieu Hospital	Longue Pointe, P.Q.	59
Protestant Hospital	Verdun, P.Q.	24
Eastern Hospital	Brockville, Ont.	9
Rockwood Hospital	Kingston, Ont.	41
Toronto Hospital for Insane	Toronto, Ont.	11
Hamilton Hospital for Insane	Hamilton, Ont.	26
Mimico Hospital	Mimico, Ont.	8
Hospital for Feeble-minded	Orillia, Ont	1
London Hospital for Insane	London, Ont.	19
Homewood Sanatorium	Guelph, Ont.	6
Ontario Military Hospital	Cobourg, Ont.	73
Whitby Hospital	Whitby, Ont.	3
Selkirk Asylum	Manitoba, Man.	67
Brandon Hospital	Brandon, Man.	23
Provincial Hospital Battleford	Battleford, Sask.	56
Ponoka Hospital	Ponoka, Alta.	11
Red Deer Hospital	Red Deer, Alta.	37
New Westminster Hospital	New Westminster, B.C.	7
Essondale Hospital	Vancouver, B.C.	88
St. John's Asylum	St. Johns, N.B.	15

SESSIONAL PAPER No. 14

TABLE (C)—LIST OF UNIT MEDICAL DIRECTORS AND THEIR ADDRESSES.

Unit.	Military District.	Location of Headquarters.	Unit Medical Director.
"A"	4	Montreal, P.Q.	Dr. A. E. Lundon.
"B"	5	Halifax, N.S.	Dr. J. Hayes.
"C"	3	Kingston, Ont.	Dr. E. E. Latta.
"D"	2	Toronto, Ont.	Dr. J. M. Nettleton.
"F"	1	London, Ont.	Dr. N. B. Alexander.
"G"	10	Winnipeg, Man.	Dr. N. K. McIvor.
"H"	12	Regina, Sask.	Dr. F. Guest.
"I"	13	Calgary, Alta.	Dr. G. R. Johnson.
"J"	11	Vancouver, B.C.	Dr. A. P. Proctor.
"K"	7	Fredericton, N.B.	Dr. Chas. MacKay.
"L"	11	Dawson City	Dr. W. W. Chipman.

TABLE D

The following figures show:—

Patients on strength January 3, 1920—

Tuberculosis	2,032
Insane	910
General	5,089
Total	8,031

Included in the above are:—

Vocational students	385
Outpatients Class 1	1,576

Number of Patients treated by Military Hospitals Commission between January 1, 1917 and March 30, 1918, 28,258.

Patients treated between April 1, 1918, and January 3, 1920	34,554
Number of treatments given to Outpatients Class 2 during the week of January 3, 1920	6,963
Number of Outpatients Class 2 treatments given between May 1, 1919, and January 3, 1920	126,057
Average number of treatments now given per week	7,700
Patients given institutional treatment under P.C. 387 without pay and allowances, between March 1, 1919, and January 3, 1920, included in grand total	5,913

The percent of ex-officers Patients as compared with former ranks is 5 per cent.

Report of strength week ending January 3, 1920	8,031
Total strength week ending December 27, 1919	7,908
Tuberculosis	2,044
Insane	914
General	4,950

Vocational students, 401, included in 1 and 3.

Outpatients Class 1, 1596; included in 1, 2 and 3.

Number taken on strength week ended January 3, 1920:—

1. Tuberculosis	38
2. Insane	5
3. General	442
Total	485

Vocational students, 25, included in 1 and 3.

Out-patients class 1, 51, included in 1, 2 and 3.

Number discharged during the week:—	
1. Tuberculosis	44
2. Insane	6
3. General	294
Total	344
Vocational students, 40.	
Out-patients class 1, 101.	
Number of Deaths during week:—	
1. Tuberculosis	6
2. Insane	3
3. General	13
Total	22
Increase during week	119
Total strength	8,031

TABLE (E).—LOCATION OF CLINICS.

Unit.	
A and E Units	Quebec.
	Montreal.
B Unit	Halifax.
C "	Kingston.
	Ottawa.
D "	Toronto.
	Hamilton.
F "	London.
	Windsor.
	Guelph.
G "	Winnipeg.
H "	Regina.
	Saskatoon.
I "	Calgary.
	Edmonton.
J "	Vancouver.
	Victoria.
K "	Fredericton.
	St. John.

NOTE.—All these clinics do not necessarily mean separate S.C.R. buildings. The work in other places is looked after by the medical representatives.

TABLE (F).—MEDICAL REPRESENTATIVES, OTHER THAN AT UNIT HEADQUARTERS, SUB-OFFICES AND INSTITUTION APPOINTMENTS.

SUMMARY BY UNITS.

Unit.	No. of Medical Representatives.
A and E	26
B	70
C	61
D	40
F	25
G	51
H	10
I	3
J	60
K	8
L	1
Grand Total	356

Centres where representatives are not located are covered by the appointees in S.C.R. offices and institutions.

Additional appointments are made from time to time as need becomes evident.

SESSIONAL PAPER No. 14

TABLE (G).—MEDICAL STAFF, CLASSIFIED BY UNITS, SHOWING SERVICE IN C.E.F. AND OVERSEAS WITH PERCENTAGES.

Full time staff shown in heavy type and part time (including medical representatives) in light type.

Unit.	Medical Officers.	Nurses.	No. with C.E.F. Canada Service.				No. with Service Overseas.				Staff other than C.E.F.			
			Doctors.		Nurses.		Doctors.		Nurses.		Doctors.		Nurses.	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Head Office	**4**	**0**	**1**	**25**	**0**	–	**3**	**75**	**0**	–	**0**	–	**0**	–
	1	0	0	–	0	–	1	100	0	–	0	–	0	–
"A" & "E"	**23**	**48**	**2**	**8½**	**2**	**4**	**17**	**74**	**28**	**58½**	**4**	**17½**	**18**	**37½**
	40	0	2	5	0	–	10	25	0	–	28	70	0	–
"B"	**14**	**11**	**2**	**14**	**1**	**7**	**11**	**79**	**8**	**57**	**1**	**7**	**5**	**36**
	20	0	6	30	0	–	6	30	0	–	8	40	0	–
"C"	**17**	**17**	**2**	**11½**	**0**	–	**13**	**77**	**13**	**76½**	**2**	**11½**	**4**	**23½**
	68	0	5	7½	0	–	29	43	0	–	34	49½	0	–
"D"	**55**	**64**	**2**	**3½**	**1**	**1½**	**51**	**93**	**43**	**67**	**2**	**3½**	**20**	**31½**
	52	0	4	7½	0	–	32	61½	0	–	16	31	0	–
"F"	**22**	**23**	**2**	**9**	**1**	**4½**	**17**	**77½**	**9**	**39**	**3**	**13½**	**13**	**56½**
	26	0	2	8	0	–	14	53½	0	–	10	38½	0	–
"G"	**23**	**10**	**0**	–	**1**	**10**	**23**	**100**	**6**	**60**	**0**	–	**3**	**30**
	43	0	1	2	0	–	21	49	0	–	21	49	0	–
"H"	**5**	**9**	**0**	–	**0**	–	**3**	**60**	**9**	**100**	**2**	**40**	**0**	**0**
	19	0	0	–	0	–	15	79	0	–	4	21	0	–
"I"	**17**	**13**	**1**	**6**	**13**	**30**	**1**	**182**	**21**	**21**	**2**	**12**	**9**	**49**
	14	0	1	7	0	–	1	43	0	–	7	50	0	–
"J"	**21**	**21**	**1**	**5**	**0**	–	**16**	**76**	**11**	**52**	**4**	**19**	**10**	**48**
	45	0	2	4½	0	–	21	47	0	–	22	49	0	–
"K"	**9**	**16**	**1**	**11**	**0**	–	**6**	**67**	**8**	**50**	**2**	**22**	**8**	**50**
	10	0	0	–	0	–	5	50	0	–	5	50	0	–
"L"	**1**	**0**	**0**	–	**0**	–	**1**	**100**	**0**	–	**0**	–	**0**	–
	0	0	0	–	0	–	0	–	0	–	0	–	0	–
Totals	**211**	**265**	**14**	**6½**	**19**	**7**	**175**	**83**	**156**	**59**	**22**	**10½**	**90**	**34**
	338	0	23	7	0	–	160	47	0	–	155	46	0	–

Note re Table (G).—In early administration great difficulty was experienced in obtaining staff with overseas service, because such staff could not be spared from the C.A.M.C. Non-overseas staff is being replaced as rapidly as possible by those with overseas experience. Also, it may be noted that in certain outlying towns and villages, where necessary, medical representatives have been appointed, but no doctor with overseas experience was available or resident there. Also, very few nurses amongst overseas sisters are available, having experience in tubercular nursing. This accounts for many nurses in sanatoria without overseas experience.

REPORT ON ORTHOPÆDIC AND SURGICAL APPLIANCES BRANCH.

Submitted by R. W. COULTHARD, *M.E., Director Orthopædic and Surgical Appliances Branch.*

In June, 1916, the Military Hospitals Commission of Canada was confronted with the problem of the after-care of members and ex-members of the Canadian Expeditionary Force, who had suffered amputation or otherwise been disabled so as to call for the use of surgical appliances such as would satisfy each individual case. Negotiations were later commenced, and arrangements are now completed whereby disabled cases of the C.E.F., resident in England, and those of the B.E.F., resident in Canada, may have their requirements attended to on a repayment system by their respective Governments.

After having thoroughly investigated the question, and taken into consideration the conditions prevailing in Canada, it was determined that a government-owned-and-operated establishment for the manufacture of artificial limbs, and other surgical appliances, would meet the situation.

There were no artificial-limb factories in Canada having the capacity sufficient to cover the abnormal needs occasioned by the war, and such as existed were located chiefly in the large industrial centres of the east. Further, no standard type of artificial limbs or other surgical appliances was universally available throughout the Dominion, and it was deemed an absolute necessity that standard types be adopted so that disabled soldiers, who eventually would be scattered far and wide over the country, would much more easily be able to obtain renewals and repairs.

Government proprietorship was further thought to be the best means of keeping in touch with and for adopting all the latest improvements in designs from other countries, as co-operation between Governments could be established. This co-operation afterwards became active, and at the present time there is an exchanging of ideas between this branch and the similar institutions of several of the Allied Governments. Again, government control seemed to offer the best means of initiating and carrying on experimental and research work on a scale such as would be productive of results, in keeping with the standardizing policy.

The Research Department, afterwards established, has done much valuable work in the many improvements and new ideas that have been brought to bear on artificial limbs, etc.

Limb fitters and surgical instrument makers were few in number in this country in the years previous to the war, but now there is employment for much of this class of labour owing to the sudden magnitude to which this industry has grown, and it was necessary to teach men to become skilled in this work. To assist in the policy of establishing returned men in trades, it was determined to train as many as possible in this work. (See Table.)

In August, 1916, the first government artificial limb shop was temporarily opened at No. 47 Buchanan street, Toronto, with a floor space of 6,000 square feet. Its equipment consisted of a lathe, band saw, hack saw, grinder, drill, anvil, emery wheel, blower and brazing outfit, 5 horse-power motor. A practical limb-maker was placed in charge of a staff consisting of six men and a boy. This staff was later increased to thirteen in all, and by the 21st April, 1917, after working for eight months, they succeeded in supplying:—

Double amputation	(both thighs)	1
Right leg	(above knee)	32
Right leg	(below knee)	38
Left leg	(above knee)	43
Left leg	(below knee)	37
Right arm	(above elbow)	16
Right arm	(below elbow)	15
Left arm	(above elbow)	20
Left arm	(below elbow)	14
Total		216

In February, 1917, the shop was moved to larger premises at 426 Yonge street, but it was soon found, with the ever-growing number of casualties, that the production of these appliances would have to be undertaken on a much larger scale. Also, as time passed, it was found necessary to provide for a much larger variety of appliances. In addition to artificial limbs there were orthopædic boots, splints, braces, and many other types of minor orthopædic appliances for which provision had to be made. The manufacture of many of these was accordingly undertaken, and the remainder, for which there was not sufficient demand to render it economical of manufacture, was provided for by purchase outside.

As a result, the sixth (or top floor) of Keens building, at 185 Spadina avenue, was acquired and soon after the fifth floor was taken over. In December it was necessary to take over the fourth floor to accommodate the administrative staff, stores, and shipping room. Late in 1917 the fitting shop was constructed and operated in the grounds of Davisville Hospital. This shop has been moved into a more commodious two-story building in the grounds of the Dominion Orthopædic Hospital at Christie street, and will handle all hospital cases and discharged men in Toronto area, and will allow the factory at Keens building to produce parts for stores and for branch depots.

These branch fitting depots have been established at Halifax, Fredericton, Montreal, Kingston, London, Ont., Winnipeg, Regina, Calgary, Vancouver.

Sub-depots are located at Ottawa, Edmonton, Victoria.

The branch depots are under the direct supervision of the local unit Assistant Director, and are adequately staffed and equipped to provide renewals and repairs for men who have moved to these districts after receiving their first limb, or other appliance, at Toronto, and consequently discharged from the service.

The branch is controlled by a Director who reports to the Deputy Minister direct. The other executives at the head office are:—Assistant to the Director; Chief Accountant, who is in charge of records, pay-rolls, and the cost-accounting system; Production Engineer, responsible for factory production at head depot; Designs Engineer, who is in charge of experimental work, designs and inspection.

Factory, machine shop, nickel-plating shop, woodworking shop, leatherworkers shop, paint and varnish shop, rawhiding shop, assembling and finishing shop, blacksmith's shop, plaster room, fitting shop. The factory is thus equipped to turn out appliances in every detail within its own plant.

For the distribution of artificial legs to the depots throughout the Dominion the factory manufactures set-ups, which are stock sizes of shins, knee-blocks, and feet, partly assembled. To these the fitter at the depot attaches the bucket which he has shaped from the willow block to the stump of the individual amputation case, and all that remains is to complete the assembly and finish.

Stock surgical splints and other appliances are manufactured at Toronto and distributed to the depots. In this way production stands on a good manufacturing basis, as it is the result of the operations of one large central plant.

Each department of the factory is in charge of a highly-skilled foreman, and the great majority of the men under their charge are returned soldiers, many of whom were taught the trade in the factory school at Davisville. Students of this school were mostly men who had already skill in one or more of the allied trades, and were given instruction to enable them to be efficient in the work of the factory. The following analysis of the entire male staff employed by the O. and S. A. Branch in Canada shows:—

	Per Cent.
Ex-members of the C.E.F.	78
Ex-members of the C.E.F. who saw service in some theatre of war	66
Exempted, over age and under age	13
Civilians, other than above	9

It may here be added that 48 of the employees are amputation cases. The total number employed by the branch is 348.

The average costs of artificial limbs manufactured in the department's factory, as compared with prices quoted by private firms, are as follows:—

Department Soldiers' Civil Re-Establishment—		
Artificial legs	each.	$71 57
Artificial arms	"	77 56
Private Firms—		
Artificial legs	each.	120 00
Artificial arms	upwards each.	100 00

The factory employees are paid at the same rate as prevails in the labour market for similar trades. A bonus scheme was put into effect for factory employees on the 1st July, 1919. This bonus is effective only with ex-members of the Forces. It is operated on a sliding scale, and is applied as follows:—

For employees (ex-members of Forces) earning 50 cents per hour and 55 cents per hour	10 per cent bonus.
For employees (ex-members of Forces) earning 60 cents per hour and 65 cents per hour	8 "
For employees (ex-members of Forces) earning 70 cents per hour and 65 cents per hour	6½ "

RESEARCH DEPARTMENT.

The work of this department, in charge of the Designs Engineer, serves three purposes: Research, designs, inspection.

Research.—This branch takes charge of all experimental work, developing and testing practical ideas, devised or submitted, and endeavours to improve existing types of appliances from a mechanical standpoint. To ensure first-class work this department is fitted with most accurate and up-to-date machinery, and to this end highly-skilled mechanics are employed. When a new model is constructed it is tested on a patient who is generally an instructor or employee, so that improvements or alterations considered necessary, according to the test, may be made.

Designs.—The approved model is drafted out in detail and specifications drawn up before being turned over to the factory for production. In addition, the depots are kept supplied with blue-prints and specifications of every standard article.

Inspection.—All parts manufactured are inspected during process: also all material, on being received from the vendors. The completed assembly is inspected before the appliance is passed to the surgeon for approval and issue to the patient. The following are a few of the appliances which have been invented or improved by the Research Department: Canada arm, differential arm, Government hook (large and small), adjustable drop foot splint, standardization of knee joint, double amputation wrist connection, development of felt feet, hands, and other essential improvements to appliances in general.

All amputation cases are concentrated at Toronto on arrival from England, also the majority of other orthopædic cases are centred in this city. These men, before discharge, are provided with appliances which are considered best to enable them to carry on in civil life when, in the opinion of the surgeons, they are considered in a condition to be fitted. All appliances are fittted in the first instance under the supervision of the surgeons of the Canadian Army Medical Corps, and are approved by them as to design.

In every case the appliance, after manufacture, is fitted to the patient in the presence of the consultant, who certifies that he is satisfied with the surgical fit.

After discharge a patient who requires replacements, renewals, or repairs of his appliance, if in a Toronto area, applies direct to the orthopædic consultant for the branch, or if in any other area, applies to the unit medical director of the unit of his particular area.

In addition, there are medical representatives in almost every township, who look after the interests of cases who reside in their respective localities. Appliances for cases resident outside of Toronto, which are sent through the mail, are forwarded to these medical representatives, who fit them to the patients and certify as to surgical fit.

In order that a complete understanding should exist between all members of the medical profession in the service of the branch and the factory, a catalogue illustrating all standard appliances, with instructions as to measurements required, was published and distributed to all concerned. The catalogue is issued in the loose-leaf system in order that appliances devised from time to time may be engraved, and copies sent to those in possession of the catalogue, so that it may be kept up-to-date.

In instances where a man has to leave off work pending renewal of appliance, or has to attend at a depot to have his case given attention, pay and allowances, as laid down in Privy Council Order 387, are granted by way of compensation.

Issues, according to present procedure, are as noted below.

Artificial Legs—

1 peg leg.
2 standard artificial legs.
1 pair of braces (with each limb).
6 stump socks (").
1 set of boots (three in all with each limb for single amputation cases)
or
1 pair of boots (for double amputation cases).

Artificial Arms—

1 Dress arm.
1 Working arm.
1 pair of braces (with each arm).
6 stump socks (").
1 set 4 gloves.

Orthopædic Boots—

2 pairs per annum (and repairs).

Patients whose disability is of such a nature that special boots have to be manufactured, are issued with same free of cost.

Patients whose disability is of such a nature that they only require slight alterations to boots of stock pattern, may have these alterations made to boots provided by themselves, free of cost.

Minor Orthopædic Appliances—

These are provided as per prescriptions received from surgeons.

The appended statement indicates the number of limbs, boots, minor orthopædic appliances, major repairs and sundries furnished to patients by the Orthopædic and Surgical Appliances Branch up to December 31, 1919:—

New legs delivered	3,543	
New arms delivered	1,571	
Total artificial limbs furnished		5,114
New sockets delivered	1,416	
New arm parts delivered	1,027	
Peg legs delivered	1,036	
Boots made and delivered	6,486	
Minor orthopædic appliances	16,921	
Major repairs completed	5,416	
Total minor orthopaedic appliances, major repairs and sundries		32,302
Total		37,416

CATEGORY OF EMPLOYEES, ORTHOPAEDIC AND SURGICAL APPLIANCES BRANCH, AS AT JANUARY 22, 1920.

	Toronto.	Montreal	Kingston and Ottawa.	Winnipeg.	Regina.	Calgary and Edmonton.	Fredericton.	Vancouver and Victoria.	Halifax.	Sub-Total.	Total.	
Service in France	162	14	7	8	4	10	2	19	1	227		
Service in England	19		2	2	1			2	1	27		
Service in Canada	10		1			1		1	2	15	269	Total of discharged soldiers.
Under and over age for military service	30	3		1		3		2		39		
Of age but no service	10	1								11		
Exempted from military service	2	1		1			1		1	6	56	Civilians.
Females	15	2		1	1	1		1	1		22	Females.
	248	21	10	13	6	15	3	25	6		347	Total of employees.

Discharged soldiers, percentage of total	78%
Male staff, percentage of total	94%
Civilians, percentage of staff	22%
Females, percentage of total	6%

REPORT ON VOCATIONAL TRAINING.

Submitted by N. F. PARKINSON, *M.A.Sc., Director of Vocational Training, in collaboration with* W. E. SEGSWORTH, *M.E., Director of Vocational Training, 1917-19.*

The problem of bringing men disabled by war back to their full earning power in civil life can be divided into two parts—medical and industrial. The medical part is taken care of by the Army Medical Corps and the Medical Branch of the Department of Soldiers' Civil Re-Establishment.

The industrial rehabilitation of the soldier so disabled by war service as to be unable to return to his pre-war occupation, is entrusted to the Vocational Branch of the Department of Soldiers' Civil Re-Establishment.

RE-TRAINING POLICY.

In retraining disabled soldiers, a great many of whom are unskilled men without definite occupations, or of the less highly skilled occupations, two policies are open to the Government.

1. To take all these men and train them in highly skilled trades, such as carpenters, printers, plumbers, machinists, etc., which, if they have no skill to build upon, would take from one to three years, or possibly more.

2. (*a*) If they are skilled in some occupation, to build on that foundation by training them in some lighter occupation closely allied to it where their former experience may be made use of; or

(*b*) If they have no former skill to build upon to train them in some occupation, in which they will be able to earn the full going wage. This can be accomplished in an average of from six to eight months.

The second method has been adopted as a general principle in all allied and enemy countries, and also in Canada. While we speak of training a disabled man for a new occupation this should not be misunderstood. It is definitely part of the policy of the department in every case of disablement to train a man in an occupation as closely allied to his former one as possible. If a man has been a printer and has an amputation of the leg, he should be trained to operate a linotype or monotype machine. If he has been a house carpenter and is so weakened that he cannot climb over a building, he should be taught cabinetmaking. If he is a high-tension wireman and cannot carry on he should be given some of the lighter lines of electrical work. A disabled railroad brakeman should become a telegrapher, train despatcher, or something on the railroad, thus carrying on in his own environment. However, for the disabled unskilled labourer, some occupation should be selected in which he can earn the full going wage in the locality in which he resides. The illiterate mine labourer, if he has mechanical aptitude, should be taught to run concentrating tables or stamp mill. The unskilled labourer may be taught shoe repairing or some such occupation, and the unskilled European who has fought in our armies, may be taught some occupation suited to his nationality. For instance, Finns and Italians take kindly to tailoring.

DIVERSITY OF OCCUPATIONS TAUGHT.

It is a definite principle of the department to train the whole number of disabled men in as many occupations as possible instead of in a few, so that competition between the men themselves and others in these occupations will be as small as possible. The number of different occupations in which men have been or are being trained by the department is 380.

Those who receive this training are in age all the way from youths to men of 50 years. In education, from the illiterate to the university student. Industrially, anywhere between the limits of the lowest grade railway labourer and the highly skilled mechanic. While a large number are single, fully half the men taking training are married and have children or have dependents, as well as other responsibilities. In industrial experience they range from the boy who has never worked for wages, to the mechanic, artisan, clerk, and professional man, who has been engaged in industrial life fifteen or twenty years.

With the policy herein stated in view, and in consideration of the new factors introduced, a system of re-training has had to be built up to meet these new conditions which is totally unlike any training or educational system heretofore in operation.

HISTORY AND GROWTH.

Before the present war attempts had been made in several places to train the crippled soldier and the industrially handicapped.

In the early months of its existence the attention of the Military Hospitals Commission was directed to the problem of the training of disabled soldiers, both from its own experience and hearing of the work in other countries.

The president of the commission at that time determined to have a centrally directed system so that the benefits of vocational training could be extended to all soldiers entitled to the same, no matter where they resided in Canada. The Government accepted this policy, regarding itself as responsible for this problem, and determined to shoulder that responsibility and carry it through.

In January, 1916, Mr. T. B. Kidner, who was Director of Technical Education in the city of Calgary, Alberta, was called to Ottawa by Sir James Lougheed, to undertake the organization of this work in Canada for the commission, the basis of the organization having already been laid down. In March, 1916, Mr. Kidner visited the various provinces of Canada and made arrangements to secure the co-operation of the

provinces. It was arranged that in each province a voluntary committee would be appointed, on which there would be representatives of education, labour, agriculture, manufacture, and others who were interested and could bring specialized knowledge to bear on the training of these disabled soldiers. It was also arranged with the various Provincial Educational Departments that they should loan to the Dominion Government men to undertake this work.

In the province of Ontario it was arranged that the Military Hospitals Commission should select the men for training, and designate in what subjects they were to be trained, and that the Ontario Soldiers' Aid Commission should undertake the training as agents for and at the expense of the Dominion Government.

In the spring of 1916, work was started in a number of hospitals throughout Canada. At the commencement of the work in the hospitals, classes in general subjects were established, in which those who desired to do so might brush up their education before taking up new subjects. One of the earliest classes put on was teaching English to foreign-born members of the Canadian Expeditionary Force, of whom a number had been returned. More from a recreative than an educational point of view, instruction in simple work of arts and crafts was introduced.

It was soon found, however, that while a few men could be sufficiently trained before discharge to become proficient in some occupation a large number were being discharged before their training was complete. In order to take care of these men it became necessary to continue their training after discharge, and some authority had to be granted for their support during this period. On the 29th of June, 1916, an Order-in-Council (P.C. 1472) was passed, fixing a scale of pay and allowances, and giving the Military Hospitals Commission authority to train after discharge men who were so disabled by war service that they could not follow their previous occupation. The practical development of the system of industrial re-training dates from the passing of this Order-in-Council.

Up to July, 1917, thirty-nine occupations were being taught, but it was found that forty-two per cent of the men selected, three, viz., Commercial, Civil Service, and Motor Mechanics, thus leading to overcrowding and the competition of disabled men, not only with other disabled men but with those already in these occupations.

Experience in technical schools had shown that there were only a small number of occupations in which a man could be successfully trained in a school, therefore the obvious solution of the difficulty was to train the men in industry. Another reason for this policy was that the cost of equipment and buildings for training men in occupations in schools was very high, and the transition from training to wage earning was easier if the men were trained in the industry itself rather than in the school.

TRAINING IN INDUSTRIES.

In July, 1917, Mr. W. E. Segsworth, M.E., of Toronto, became Director of Vocational Training. He at once put into effect the system of training men in industries, and thus brought the work into closer touch with labour and employers, and gave a more practical trend to the whole policy. The result of this change in policy has been that at the present time the department is training, or has trained, men in the above number of different occupations.

RAPID DEVELOPMENT OF RE-TRAINING—1917.

During the year 1916 the work of the Vocational Branch received so little encouragement from either the public or the men that the increase in the number of students was small, but the rate of increase was accelerated to a marked degree during the first half of 1917, and in the latter part of the year, owing to publicity among the soldiers and the public.

SELECTION OF STAFF.

The question of staff had become a pressing one. Up to that time both the executive and teaching staff had been drawn from men who had previous training in educational work. It was felt that in order to bring the work more closely in touch with the labour and manufacturing interests, and put it on a practical basis, the executive staff at least should be composed in some part of men who had had previous experience in industry and trades, who understood the point of view of both the labour organizations and the employers. With regard to this, it was felt that soldiers who had been craftsmen, if properly selected, would make better instructors for other returned men than men who had spent their life in teaching.

This policy was immediately put into force and has been adhered to ever since, and among the male members of the staff the percentage of returned soldiers has risen from 37 per cent at the end of 1917, to 89 per cent at the end of 1919. On December 31, 1919, the returned soldiers on the staff of the Vocational Branch numbered 1,639 or 89 per cent of the total male staff; male civilians numbered 204, which number included messengers (under age) and instructors having special technical qualifications.

FOLLOW-UP SYSTEM.

At the beginning the instructor in charge of the work in the hospitals was assigned the duty of interviewing soldiers to see whether they needed re-training or were entitled to its benefits. There was no compulsory system of interviewing. A large number of men were discharged and passed into civil life, who could not compete with their fellow workmen, and these men kept constantly returning to the department for training. Those who needed training and did not return, spread dissatisfaction throughout the country. It was therefore decided in the fall of 1917, that all men passing through the invalided section of the army must be interviewed before discharge. At this time the Vocational Branch began to go through all the back files and write to all invalided soldiers who had been discharged without an interview, in order to call their attention to the advantages of vocational training.

At the beginning of 1918, the department introduced and organized the follow-up and after-care section. Its duty was to receive notification a month before a man was about to graduate in order, if possible, to secure a position for him; to place him in this position, and then to see that it was suited to him and that he was making a success of his work there. It was also his duty to obtain and keep statistics as to the work graduates were doing, the wages they were receiving, and their relations with their employers, fellow workmen, and the trades unions, if they were engaged in a unionized occupation.

As the work continued, it was found that a small number of men were falling ill, not only from a recurrence of their disability, but from minor complaints; therefore a regulation was put into force that all men receiving training should get free medical treatment during their course of training.

A new section for the training and after-care of blinded soldiers was created in August, 1918, under the care of Capt. E. A. Baker, M.C., Croix de Guerre, who is himself blind on account of war service. This is distinct from other branches of training.

ALLOWANCES TO THOSE UNDERGOING TRAINING INCREASED TO MEET INCREASED COST OF LIVING.

Shortly after the department was created it was decided that the pay and allowances which were in existence up to that time were hardly adequate to meet living expenses which had been increasing for some time. A new Order in Council,

P.C. 1366, was passed on June 22, 1918, providing a new scale of pay and allowances effective until March 1, 1919, when an increased rate under P.C. 387—1919 went into effect.

At the beginning of 1918 there were 133 graduates; at the end of 1918, 2,285 students had completed their courses. At the beginning of 1918 there were 954 re-training students; and on December 31, 1918, the number had increased to 3,189, notwithstanding the number who had graduated in the meantime. As a further comparison the number of graduates on December 31, 1919, was 9,455, while the number of men attending classes was 23,614.

PRESENT ORGANIZATION—VOCATIONAL BRANCH.

At present the work of the Vocational Branch is divided into three parts: 1. Ward occupations. 2. Curative workshops. 3. Industrial re-training.

A far-reaching decision was arrived at by the Government in February, 1918, which has since worked out to the advantage of all, that in the hospitals controlled by the Department of Militia and Defence, occupational therapy should be administered by the Vocational Branch of the Department of Soldiers' Civil Re-Establishment, this department supplying and controlling the equipment and personnel, but the work to be directed by the Army Medical Corps of the Department of Militia and Defence.

Ward occupations are taught and administered in practically every hospital in Canada by women in distinctive uniform on the staff of the department. As the work is curative, it is entirely under the direction of the Officer Commanding the hospital, and his doctors.

Curative workshops are attached to practically every hospital treating ex-members of the Forces throughout Canada. The work conducted in these shops is for those patients who are convalescing and can leave the wards. While the primary object of these workshops is curative, a number of the men attain a certain skill in the various occupations which they study, which skill is of use to them in after life, but there is no definite attempt made here to finish their training in any of these occupations completely.

The organization of the Vocational Branch is as follows: In Ottawa there is a central administrative office presided over by a Director of Vocational Training, with his staff. In each province with the exception of Prince Edward Island (which is attached to Nova Scotia) the Director of Vocational Training has a representative known as the District Vocational Officer, who administers all the work in his territory.

The principle has been adopted of giving the District Vocational Officer as much freedom of action as is consistent with the administration of a government department, and holding him responsible for results. Certain parts of the work, however, are centralized in Ottawa, such as the final approval of courses, renting and purchase of buildings, the purchase of equipment and materials, the approval of pay and allowances, statistics, and those things in general which are matters of Government policy.

The administration in the units may be divided into the following sections: Interviewing and boarding for courses, industrial surveys, pay and allowances, medical advice and social service, training, inspection, follow-up and after-care employment.

INTERVIEWING AND BOARDING FOR COURSES.

If it is considered that a man cannot return to his previous occupation due to his war injuries, and the man himself, the interviewer, and the Vocational Medical Adviser have tentatively made up their minds as to the proper occupation for him to learn, he is brought before a Disabled Soldiers' Training Board. This board is composed of

the District Vocational Officer or his representative in the person of the interviewer, the Vocational Medical Adviser, and from one to three or four members drawn from the district advisory committee. As far as possible, the department endeavours to have on the Disabled Soldiers' Training Board a member of the advisory committee who is familiar with the trade or occupation into which the man is about to enter. The Disabled Soldiers' Training Board talks over, confidentially and intimately with the man, the work he intends to undertake, its recommendation is sent to Ottawa, and either concurred in or rejected.

If the man is to be given a course of training in an industrial establishment, the interviewer usually arranges that he and the handicapped soldier confer with the employer who is going to train him, before the recommendation is sent to Ottawa, so that the advice of the latter may be taken. The interviewers are practically all returned soldiers selected from men who before the war had industrial experience.

VOCATIONAL MEDICAL ADVISERS.

The medical advisers in the districts are detailed to the local office by the local Unit Medical Director. They furnish the District Vocational Officer with medical advice as to whether the man's disability was received on or aggravated by service; as to whether he can return to his former occupation; whether he is medically fitted for the new occupation selected by him; and after he has started his course, as to his continued suitability for the occupation he is learning. They also inspect men reporting sick during training, and if necessary, send them to the Unit Medical Director for treatment, and undertake researches regarding the medical aspect of industrial retraining.

INSPECTORS.

As a great many men are being trained in industry, it is necessary to carry out an inspection every week and to secure a confidential report, for the following reasons: To prevent exploitation of labour, to see that the men are actually receiving the training necessary to bring them to a state of efficiency, to see that their health is not breaking down, to see that the relations of the men with their employers and fellow workmen are satisfactory, and to see whether they are likely to succeed in the courses of training undertaken, and if not, to advise that a change be made.

DISCIPLINE.

The discipline exercised over the men is that ordinarily exercised in civil life—the pay cheque. Their time is kept the same as in employment, and if they present themselves every day to take training they receive allowances for that time. If, on the other hand, they absent themselves from the class or place where they are training, without excuse, allowance for the period absent is deducted. If the men are sick they are given free treatment and excused from classes.

All men being trained "live out." This is part of the general policy of the department to cast the men as soon as possible upon their own responsibility.

WARD OCCUPATIONS.

Vocational work in the hospitals in Canada was started from an educational point of view. It was not long, however, before its curative value became evident, and classes were organized for occupations requiring physical exertion, such as carpentry, auto mechanics, etc. This was the beginning of curative workshops. The value of this branch of occupational therapy was so marked from a therapeutic standpoint that it was decided to commence work earlier, during the period patients were in hospital. At this time, although curative workshops had been provided, it was no uncommon sight to see large numbers of men in an institution spending their time in complete

idleness or else in card playing, or in games of chess or checkers. It seemed impossible to get the majority of the men to the curative workshops. There was a gulf between the state of idleness and the habit of work in the shops. This has now been successfully bridged by the work of the ward aides.

In the curative workshops the work is somewhat heavy, and while it has a diversional side this aspect has been reduced to a minimum. In ward occupations, however, the diversional side of the work is found to its greatest extent. In the whole process of bringing the invalid back to his proper relation to civil life, a beginning must be made by diverting his mind from the morbid state into which it may have fallen. In diverting his mind a mental stimulus is necessary. As the work proceeds, through the more serious subjects taught in ward occupations and curative workshops, the diversional side of the work decreases, the mental stimulus increases, and this, together with the increased physical activity, hastens the functional cure.

The peculiar value of this work lies in the fact that no matter how helpless the invalid is, there is something he can do to occupy his mind. In severe cases the ward aides may find it necessary to read to the patient first in order to stimulate his interest. By gradual steps the man's physical and mental activities are transferred from diversion to occupation, from unconnected work to processes having sequence and order.

The first impression made on a visitor to a hospital in which returned men are being treated is the great activity displayed; the patients on all sides, including those in bed, engaged in a variety of occupations, the smartly uniformed young women busily engaged in guiding and helping in the work, and the happy, contented atmosphere pervading the whole place.

Baskets in every stage of operation and of every variety, weaving looms both large and small, turning out every pattern and design one can think of, frequently operated by a man with only one arm; some patients doing wood carving, some making bead chains, other doing knitting and fancy work; still others with an eye to the future, being engaged in a course of study in order to brush up their former vocation, and so on, are in evidence.

THE VALUE OF WARD OCCUPATIONS.

There has been a great deal of argument about the value of ward occupations. Some say basketry, weaving, etc., should not be taught to men, that they are effeminate occupations. There is no intention that the occupation taught in the wards should be followed for gain after leaving the hospital; this work only leads up to the more serious work in the curative work-shops. It is the medium through which the first mental stimulus is introduced. It is the agency by which a patient is induced to forget himself and take an interest again in other people and other things.

Ward occupations were instituted at about the same time in 1917 in two centres—Montreal and Whitby. At Montreal, much valuable assistance was voluntarily rendered at that time by Mrs. J. H. Peck, of that city, who has interested herself in Canadian handicrafts for many years. In both these places the work was started as an experiment to fill a long-felt want. By the the spring of 1918 the value of the method had been so demonstrated that it was thought desirable to spread it quickly throughout the whole of Canada.

SELECTION AND TRAINING OF WARD AIDES.

The choosing of a young woman to be trained as a ward aide is important. She must be of the very best type, well educated, and must possess a personality which is bound to please, together with a healthy constitution. It is desirable that she should be between the ages of 25 and 35, have unlimited patience, be intelligent, and not too emotional. She must be prepared to meet all kinds of difficulties and all kinds of treatment. The work is very hard. This is largely due to the mental strain to which these workers are subjected.

The experience of the department, however, has shown that a period of three months is quite sufficient to train Ward Aides.

All the Ward Aides in Canada are paid and have regular hours; there are no voluntary workers. During training they receive $55 per month, and after graduation, $75 per month, out of which they pay their own living expenses. They are also supplied with uniforms. Every girl must take a course of training and sign a contract to stay with the Department at least one year, and must go to any part of Canada where she is sent. The organization throughout Canada is as follows:—

In Ottawa there is a Supervisor of Ward Occupations who controls the work throughout Canada, through the Director of Vocational Training.

In each district the Ward Aides come under the District Vocational Officer for administration. This officer has a Supervisor of Ward Aides in charge of all the Ward Aides in his district.

In each hospital one woman is in charge of all the Ward Aides in that hospital; in large hospitals where there are a large number of Ward Aides her duty is purely administrative, but in small hospitals where the number is small she may assist in the work herself.

SALE OF ARTICLES MADE BY PATIENTS.

When material is supplied to a patient he is charged with the cost of same in his account, also with a small amount to cover overhead expenses, freight handling, etc., but nothing for administration. When he completes the article he is allowed to keep it on payment of the charges in his account; if he wishes to sell it, it is given a distinguishing number and he is credited with it in his account. When the article is sold the balance of the cash received over the debit in his account is returned to him.

The supervisor of ward aides in the district arranges for the sale of these products through departmental stores or other commercial mediums of sale. All articles are sold on a commercial basis—not on a compassionate one. No patient is allowed to sell his work individually in the hospitals, nor are individual sales recognized by the department. No orders for work are taken for future delivery.

Another important feature of the work of the Ward Aides is the information they are able to give to the men in the wards in regard to the activities of the Vocational Branch. They describe the curative workshops, industrial re-training, and give the men information as to the regulations of the department in regard to them. If a man is too disabled to go back to his former occupation this information immediately sets his mind at rest as to his future, and he usually begins to speculate as to what he can do when he is well enough to leave his bed.

CURATIVE WORKSHOPS.

It is not easy to draw a hard and fast line dividing the ward occupations from the curative workshops. Training in the latter, however, should be undertaken by men who have so advanced in their period of convalescence as to be able to move around freely, leave the wards, enter the shops and undertake considerable physical work. Both forms of treatment are therapeutic and curative in their object.

Four benefits are derived from the curative workshops: they provide mental stimulus, functional re-education, mental diversion, and (least of all) training, and knowledge as to a man's adaptability for a future occupation.

In the curative workshops classes in general education, commercial work, stenography and typewriting find a place. Typewriting has a direct functional curative effect on the muscles and nerves of the fingers, arms and back, but these subjects have also a curative effect mentally, as they teach a man mental concentration.

The value of the curative workshops in connection with mental cases should be fully realized. In the hospitals for mental treatment, both at Cobourg and Newmarket, very surprising results have been obtained in these workshops. Ward occupations and wood working seem to give the most benefit.

From a training standpoint the curative workshop is most useful in determining what course a man should take if he needs re-training.

As in the ward occupations, any man making an article in the shops can obtain possession of it by paying the cost of the material. No articles produced in the curative workshops are allowed to be sold on the premises nor is anyone allowed to take orders for future delivery.

In July, 1917, there were 638 men taking curative workshops and industrial re-training combined. The number in each class at that time was not known. On 31st December, 1918, there were 5,239 patients attending curative workshops. On December 31, 1919, the number engaged in curative training had dropped to 3,988.

INDUSTRIAL RE-TRAINING.

Industrial re-training may be divided into two sections:—

1. Academic training, including professional courses, general education, civil service, bookkeeping, accounting, municipal accounting, music and like subjects.

2. Such training as leads to manual occupations highly skilled or otherwise.

ACADEMIC RE-TRAINING.

The first class needs little explanation or comment, for the method of carrying out the training of this class differs little from ordinary educational systems. Business colleges, technical schools and universities are used in part, but owing to the fact that soldiers are best trained by soldiers, in order to accommodate the men entering and leaving at all times, and in other ways to adjust the training to the peculiar needs of the men, the department has organized classes taught by returned soldiers for the carrying on of this work. Those taking up professional courses are sent to the universities and colleges where they take the ordinary courses.

PRIMARY TECHNICAL TRAINING.

In the second class of training, however, the greatest departure from existing systems has been necessary, owing to the experience, age, and physical condition of the students. Arrangements were made to have a number of students accommodated for preliminary training at the technical schools in Montreal, Toronto, Hamilton and London, but in most of the provinces no facilities of this kind existed. The department therefore had to find other ways and means to accommodate the students. It was found on investigation that most of the university students in engineering courses had gone to the front, and that these universities had equipment and space lying idle. The Nova Scotia Technical College and the Calgary Institute of Technology and Art were taken over by the department, and new equipment and space added, and are now conducted by the department as trade schools.

McGill University, Toronto University, University of Saskatchewan, University of British Columbia and Queen's University, Kingston, placed at the disposal of the department such equipment and space as they had, and additional equipment was added. Arrangements were made with the Agricultural College at Truro, N.S., Macdonald College, Ste. Anne de Bellevue, Que., the Ontario Agricultural College, University of Manitoba, University of Alberta, and the University of British Columbia to undertake agricultural training. In the province of Manitoba the department built and equipped a trade school of its own.

RE-TRAINING IN INDUSTRIES.

The trainee, on the completion of a course in a technical school conducted according to the usual principles applied there, when he first enters employment on wages, finds himself among unfamiliar surroundings, and feels nervous about his ability to make good. If he is trained under actual working conditions by an employer in the occupation he proposes to follow, his transition from training to wage earning takes place with the least possible dislocation. One week he receives his allowances from the Government and the next week he receives pay from his employer. The transition is made practically unconsciously. The department therefore adopted the policy of using only for primary training, technical schools, and the methods usually applied there. As soon as a trainee could safely carry on in an industrial organization, he was placed there under practically apprenticeship conditions as to work but remaining under the supervision of the department and receiving allowances from it.

The following policies have been adopted by the department, governing training in factories and industrial establishments:—

1. That the Government will pay the full cost of maintenance.
2. That the man being trained must conform to the usual discipline of the employer as to hours of work, etc.
3. That the man himself, the employer, and his fellow workmen, must be satisfied with the arrangement.
4. That if the factory is unionized the union must be satisfied.
5. That the first month or six weeks should be considered a probationary period.
6. That proper inspection must be instituted to see that the man is making progress, that he is being actually trained and not exploited, that medically the work is suited to his disability and that it seems likely at the end of his course he will be able to earn the full going wage in that occupation.

THE PART OF EMPLOYERS IN INDUSTRIAL RE-TRAINING.

It is expected of the employer that as a national duty the man shall be actually trained and not kept on piece work, and that instruction and not production shall be the prime object. If the manufacturer were compelled to pay part of the maintenance of the man he would consider it his right to avail himself of part of his labour in order to compensate himself for the time his foreman and superintendent spend in training, and for the use of machinery, space, and material. It is for this reason that the department continues to pay allowances to trainees while continuing training in industrial establishments.

It is not always possible, when interviewing men, to decide without trial whether they are fitted for a certain occupation. The first month or so therefore is considered a probationary period, and the man and his surroundings are inspected very carefully.

It is desirable in most occupations that some training be given in schools. If the average course be taken as eight months it will be found that in certain courses it is desirable to give one month's training in school and seven months in the industry. In other occupations it is desirable to give six months training in the school and two months in the industry. Therefore, in a great many of our schools we find men taking training which is used more or less as ground work for later training in the factory.

DAILY HOURS OF RE-TRAINING.

The schools operated by the department are kept open seven hours a day. It is not intended that all men should be compelled to put in seven hours a day in school. Many, when they leave hospital and come to the department for industrial re-training, cannot work that length of time, but one of the Vocational Medical Advisers sees to it

that the hours of training in each case are not too long. While the students may work a smaller number of hours when they first come to the department, the time should be gradually increased so that during the last month or two of their courses they should be able to work seven hours. When they graduate into industrial life they will be expected to work eight hours per day, or possibly more. The department aims to so accustom them to working seven hours per day, having due regard to not impairing their physical well-being, that they will be able to successfully compete in the open market of endeavour with their un-impaired fellow-workmen who work eight hours per day.

Experience in the organization of school work has demonstrated that soldiers must be kept apart from civilians. This is due to the fact that the soldier students are on the average much older than the civilian students and they do not work well together. Also the courses for ex-members of the Forces have to be so much more flexible, and since the students are entering and leaving at all times, the classes in civilian institutions would be upset.

LENGTH OF RE-TRAINING COURSES.

The average length of course varies between seven and eight months. A few courses are short, running three and four months, but these are very few in number. Some few courses run ten to twelve months, but the long courses are in such proportion to the short courses that they will average seven months.

When a course is granted for six or eight months it is not intended that the man must definitely finish his course in that time. It merely means that this is the period within which the man is expected to finish his training. If at the end of the time allotted or shortly before, it is found that he has not quite completed his work, but that another couple of months would make him proficient, his course is extended, provided he has properly applied himself to his studies.

In carrying out re-training, three classes of institutions are utilized: Inside schools conducted by the department, outside schools such as business colleges, universities, technical schools, etc., and industrial establishments where men are apprenticed.

On the 31st December, 1918, the number of men being re-trained was 3,189. For this work 33 departmental schools, 54 outside schools, and 329 industrial establishments were used. On November 30, 1919, the number of pupils in 45 departmental schools was 6,421; in 310 outside schools, 5,265; and in 5,960 industrial establishments, 9,491; total of 21,177 attending training. The number of instructors employed in departmental schools is 397, and the average of men per teacher is 16. Included in the above were 5,710 minors who were being trained on November 30, 1919, as follows: 747 in departmental schools, 2,585 in outside schools and 2,378 in industrial establishments.

INTERVIEWING.

In the general scheme of industrial re-training there are two features which are of the utmost importance, and might be called the essential ones. They are: (1) interviewing and aiding the man in the selection of his course; and (2) the actual training for the occupation, and it is hard to say which is the more important. The success of the training for a man's future life depends so much on getting him started in the right course that one might almost say interviewing was the most important. The average cost to the country for re-training a single man, without dependents, is approximately $750. It is therefore a sound business principle to spend sufficient money on interviewing to make it successful. Sufficient interviewers should be provided to give all the time necessary to consider the man's course completely and advise with him.

It is necessary that the interviewer should have diplomacy, tact, sympathy, and the ability to enlist the man's confidence and respect. He must be able to put at ease the man he is interviewing, and to find out what the man's aims and ambitions not only are, but have been. If, in addition to these qualifications the interviewer has technical training so that he can understand by personal experience the training the man has to go through, so much the better.

It is also considered absolutely essential that the interviewer must be a returned man, as he is the only one who can talk to the man being interviewed on an equal footing.

TRAINEES SELECT THEIR OWN COURSES.

The actual application for a course of re-training may be made prior to discharge from the army, but the course does not commence until after this date. In assigning a man to a course, the first requirement is that the man himself must be satisfied. The success he attains will depend almost entirely on the amount of enthusiasm and application he puts into his work. If he is not satisfied with the course he has selected he will not apply himself and success will not result. If the department did not use the powers of suggestion, persuasion or reason, in guiding the men, it would be found that 50 per cent of them would take up commercial work, civil service and motor mechanics. Part of the interviewing may be done by the officer in charge of the curative workshops. In these curative workshops it is a comparatively easy matter by inspection, to find out whether the man has mechanical skill or not, or whether he is more adapted to clerical pursuits. This information enables the interviewer to decide what the man is best fitted for.

If an ex-soldier has a trade and is too disabled to follow it, the department endeavours to raise him higher in that trade. The general aim is to raise him from the artisan class to the supervising class of employees. The department endeavours to train him to become a specialist in some lighter and more highly skilled division in that trade. For instance, the house carpenter becomes a cabinet maker, or the printer a monotype or linotype operator. If a handicapped soldier had no trade before the war, he may be trained for an occupation.

RELATION BETWEEN NEW AND PRE-WAR OCCUPATIONS.

One of the principles of interviewing which must be kept in mind at all times is that the occupation chosen by the man must, in so far as possible, be closely related to his former calling. The general principle is that while building on a man's former occupation he should be raised from a heavier occupation in his former line to a lighter one. The lighter occupation, while being suited to his disability, usually draws higher wages.

DEVELOPMENT OF NATURAL ABILITIES.

However, there are quite a number of men who have no occupation on which to build—some left school without an occupation, and others among them have always been labourers with practically no education. They have been drifters, and have formed the great class of transient labour. A great many of these men have natural ability which has never been developed. Some are natural farmers, others have mechanical ability, and others are more fitted for clerical and sedentary occupations. With these men it has been the aim of the department by every means possible—by inspecting in the curative workshops, by interviewing, or by getting at former ambitions—to find the man's natural aptitude and train him in some occupation along that line.

The first thing the interviewer must endeavour to decide is whether or not the man is eligible for training. After a short conversation with the man as to his war experience, former life and occupation, he is asked whether he can return to it or not. If he says he can return to his previous occupation this interviewer informs him that he is not eligible for training, but that if after entering civil life he finds himself unable to follow his previous occupation, he can come back to the department and ask for training. Particulars are then taken as to his educational and industrial history and filed for future reference.

If, on the other hand, he tells the interviewer that he cannot return to his former occupation due to disability incurred on or aggravated by service, he is sent to the Vocational Medical Adviser who examines him physically and mentally to determine whether, in his opinion, this is so.

If the man is found eligible for vocational training, the interviewer then consults with him as to what training it is advisable for him to take. Wherever possible his former employer is consulted, provided the man wishes to return to his employ. In any case, if the man has to be trained in an industry, a meeting is arranged between the interviewer, the employer whom it is thought may train him, and the man himself, before the course is decided on.

INDUSTRIAL SURVEYS.

Shortly after industrial re-training was organized and schools established for the re-habilitation of disabled soldiers, it was found that the number of courses in the schools was limited to a small range of trades and occupations, and that if the policy of training men in this limited field were followed, there would be an over production of workers in this small range.

Very little information was available as to the number of men employed in any occupation, or as to the demand for trained workers. It was evidently useless to train men for occupations already crowded, and disabled soldiers would necessarily stand a better chance of making good in an occupation in which there was an active demand for workers. The department found it necessary to gather this information at first hand, and to accomplish this the industrial surveys division was organized to cover the following points:—

1. To ascertain as far as possible under present conditions, the occupational opportunities for disabled soldiers, the facilities for training them, and the possibilities for absorbing them after training, in the particular locality in which the survey is carried on.

2. To give concise, definite, and accurate information regarding these industrial opportunities, to each Disabled Soldiers' Training Board, District Vocational Officer, or interviewer, in the district where re-training is to be given.

3. To determine the fitness of existing educational institutions in a particular locality for the re-training of disabled men for industry.

4. To grade the opportunities as to the stability of the field in each locality, or in the country as a whole, since some industries are similar all over the country, while others are peculiar to certain localities, and to ascertain when enough men had been trained in each occupation.

5. To inform an applicant for a course in re-training before he enters upon that course, as to all its limitations and advantages.

6. To ascertain the attitude of manufacturers and employers of labour towards the disabled soldiers and to educate them toward a proper understanding and appreciation of the problem his case involves, and at the same time to present the aims and objects of the Vocational Branch of the Department of Soldiers' Civil Re-establishment.

7. To establish a direct personal contact between the vocational officer of the district and the managers and foremen of a large number of industries with the result that, when the returned disabled soldiers are placed in industries for the completion of their re-training, a personal interest will be taken in them by their employers.

8. To put the industrial surveyor in a position to render assistance in the establishment of aid and advice departments, follow-up systems, employment bureaux, and also in the interpretation and working of the Workmen's Compensation laws and regulations.

In making a survey of an industry the chief executives of the concern, the president, general manager, and foremen are interviewed first; finally each branch of the industry is visited and the workers performing each particular operation carefully observed. Meanwhile, survey sheets are filled in.

The first duty of the industrial survey department is to familiarize itself with the most common disabilities incurred by soldiers on active service. The medical records at headquarters, Ottawa, are carefully studied, grouped, listed, tabulated, and analyzed so as to note the effect of disability on movement.

In surveying an industry it is necessary to ascertain the number of men who may be placed there for training, specified by departments and occupations, as well as the qualifications, physical, educational and industrial, which are necessary in order to obtain the full benefit from the training offered by this industry.

Information is sought regarding the surroundings of the factory and detailed observations regarding light, heat, ventilation, number of floors, character of grounds, fire escapes, sanitation, whether or not mid-day meals may be obtained within the factory, distance which a worker may have to walk in order to get his luncheon, lodging, rent in the locality (both house and room rent), factory societies, unions, amusements, recreations, and welfare bureaux which are controlled by the industry.

It is important that information be available as to the number and occupations of maimed workers already employed, what safety appliances on machinery of various types exist, any extra or additional hazards which may be noted, whether the employment is stable or unstable, and many other matters. All the industrial surveyors are returned soldiers.

It is gratifying to note that after two years of this investigation work, most of the manufacturers who have been interviewed have shown keen interest in the project, and have given their unbiased opinion, and many times have offered very helpful suggestions which have been introduced into the training schemes. Some of the reports which were made of the larger manufacturing industries embrace an analysis of six or seven thousand workers. Other reports are of much smaller volume, but contain vital information.

These surveys are carefully indexed and filed, and the interviewers are required to keep themselves posted on the contents of these files. The information in them is also classified on card indexes under occupations. If an interviewer or training board wishes information in regard to storage battery repairing, the card will show the number of openings in that occupation, and the surveys of plants where it can be found. If a disabled soldier has before the war worked at a heavy occupation in a piano factory, the interviewer will call for the survey of the piano factory in which the man has worked, and in consultation with the man endeavour to select some lighter occupation in the factory for which he may be trained.

Through this work an almost endless number of new occupations have been discovered for disabled men. At one time it was thought that there were very few occupations suitable to the disabled, but it has been found that in nearly every industry there are many things at which a handicapped man can earn the full going wage in competition with able-bodied men.

MEDICAL ASPECT OF INDUSTRIAL RE-TRAINING.

The Vocational Branch has a sufficient number of doctors detailed to it in each unit by the Director of Medical Services, to do such medical work as is required by the District Vocational Officer, except medical treatment. All medical treatment is taken care of by the Medical Branch of the department.

The Vocational Medical Advisers come under the unit Medical Director for inspection, criticism, and advice in regard to technical medical matters, and under the District Vocational Officers for direction as to their daily duties as advisers to them.

The duties of the Vocational Medical Adviser are:—

1. To advise the Director of Vocational Training as to whether the handicapped soldier is eligible for training.

2. If he is eligible for training, to advise if from a medical standpoint he is likely to be able to carry on in the new occupation selected by him.

3. To advise the Director of Vocational Training after the man has started training as to his continued suitability for the occupation he is learning.

4. To inspect men reporting sick during training and to send them to the Unit Medical Director for treatment, if this is found necessary, and to inspect their places of training.

5. To undertake research work regarding the medical aspects of vocational training.

The last medical board is regarded by the department not as a deciding factor as to the man's eligibility, but only as evidence in the case. Numerous cases come up where it is shown that men had disabilities when they enlisted, and although there is no mention on the medical boards of any treatment of these disabilities, in many cases there is circumstantial evidence that they may have had some treatment.

The question of a man's eligibility for industrial re-training having been established, the Vocational Medical Adviser must advise the District Vocational Officer and Disabled Soldiers' Training Board as to the suitability from a medical standpoint of the new occupation selected by the man.

In order to assist the doctor in advising in regard to these matters, he is supplied with a record of the work done by the man with the ward aides and in the curative workshops. These records, if properly taken, will cast a great deal of light on the man's mental ability or his mechanical adaptability.

Another feature of the Vocational Medical Adviser's work consists of attending to the man's medical care while he is taking training. A man during training may fall sick for two reasons:—

1. Through a recurrence of his war disability.

2. Through ordinary disease or accident not connected with his war disability.

In the first case he is entitled to treatment under the regulations of the department. In regard to the second, it was felt that if a man took sick while taking training, the most economical policy was to treat him for his sickness so that he might return to his course at the earliest possible moment and his time not be wasted. The Vocational Medical Adviser, therefore, inspects the schools and factories, and if any men are found ill they are sent to the Unit Medical Director for treatment, since the Vocational Medical Advisers undertake no treatment. If his treatment is likely to be of short duration he is kept on vocational pay and allowances, but if it is likely to be of long duration he is transferred to the pay and allowances of the Medical Branch.

To give sound advice, these Vocational Medical Advisers must not only have the pre-requisite of professional ability—they must also have an intimate knowledge of industrial working conditions, which physicians usually do not need in the practice of their profession; otherwise they could not bring to bear on the medical industrial problems the necessary appreciation of industrial processes entering into them.

This specialized service was found by experience to be rendered most efficiently by physicians who divorced themselves, for the time being, from treatment of cases. This enabled them to devote their whole attention to the development of principles that might be applied in giving professional technical advice on a problem which had never before presented itself in such a comprehensive way.

CARE OF THE BLIND.

Soldiers have suffered loss of sight in many ways, but there are two fairly distinct classifications, viz.: blind soldiers and blinded soldiers. By blind soldiers is meant those who have suffered a gradual deterioration of vision due directly or indirectly to service. Blinded soldiers are those who were actually wounded in battle or were so affected by wounds that loss of sight resulted. The department is now acquainted with practically all the cases of men who are blind or potentially blind due to wounds, but those whose sight is slowly deteriating, either before or after discharge, are gradually increasing in numbers.

There are several points which must be kept in mind in connection with the re-training offered to a blinded soldier. First—he is a man who is normal in every way, but only deprived of the sense of sight. Secondly—he has received all his former education and experiences from a sighted standpoint, and requires only readaptional training which will fit his former education and experience to his present needs.

In order to secure an official for the department who would have the proper viewpoint and experience for dealing in the most effective way possible with further problems that might come up, the services of Captain E. A. Baker, M.C., Croix de Guerre, the first Canadian officer graduate of St. Dunstan's, were secured. Captain Baker had after his return been employed for nearly two years with the Hydro-Electric Power Commission of Ontario in their head office at Toronto. He had vouched for the practical nature of the re-adaptional training given at St. Dunstan's, and exemplified the idea that blinded soldiers could in many cases do better than follow one of the ill-paid handicrafts usually assigned to blind people. Captain Baker entered upon his new duties on 1st August, 1918.

Early in the war, Sir Arthur Pearson, Bart., instituted St. Dunstan's Hostel at Regent's Park, London, for the care and training of blinded soldiers and sailors. This hostel is operated along unique lines, the principal aim being to teach the men who are sent there how to be blind. In this institution blindness is not referred to as an affliction, and the men in this way are taught to face their difficulty.

At first, members of the Canadian Expeditionary Force who had lost their sight were not given an opportunity, unless they requested it, to go to St. Dunstan's, but were returned to Canada for training. Later, however, it was realized what an advantage would be obtained for the men who would be trained at St. Dunstan's where the majority of the students are returned men and where the forceful personality of Sir Arthur Pearson and his new methods of dealing with the blind would be felt. Consequently, it was arranged by the Canadian Government, in co-operation with Sir Arthur Pearson, that all Canadian blinded should be trained in St. Dunstan's before their discharge and return to Canada.

Those blinded soldiers who had returned to Canada without such training were given the opportunity of returning to St. Dunstan's for training or of attending one or other of the established Canadian institutes, including Halifax School for the Blind, Ottawa Blind Institute, Montreal School of the Blind, Canadian National Institute for the Blind in Toronto; or the training was carried out at Hart House, Toronto, where a blinded masseur, a graduate from St. Dunstan's, was employed as instructor; or at the Guelph Agricultural College, where also a blinded instructor, a graduate from St. Dunstan's, was employed in poultry raising. Several of the Canadian blinded have selected one or other of these methods of training with marked success, being now after graduation employed in a permanent capacity in civilian life.

Blind instructors are invaluable. If the man recognizes the fact that the individual giving the instruction was but recently in the same position as he himself, he realizes that the instructor will be practical and also that he is not being asked to do something that has not been done before by those labouring under the same handicap. He is at once fired with the ambition to do the thing as well as the other fellow, and

says to himself, "If the other fellow can do it, I can." This mental stimulus cuts down the period of training greatly. Also by eradicating the term "affliction" and impressing each man with the idea that he has but to overcome a handicap which has been imposed, a more cheerful and ambitious bearing is induced.

To increase confidence, attention must be paid not only to work, but to recreation and sports. By occupying every moment of spare time the man's mind is not permitted to dwell on his limitations, and he is rendered capable of taking part in games and sports particularly suitable. As has been said, a man learns by experience, and through various forms of sport is taught to be self-reliant and confident in his movements.

The range of subjects taught to blinded soldiers may be divided into three classes: General-re-adaptional education, vocations, and avocations or side-lines. Included in these are typewriting, massage, business courses, carpentry, poultry farming, basket-making, etc. Men are from the beginning taught to read and write by the Braille method. Every man who has made good progress is presented with a Braille writer on graduation, and with this he can record his own notes for future reference, and attend personally to his private and business papers. In many instances a typewriter is also presented.

After-Care.—It is one thing to train a blinded soldier in such a way as to follow some definite line of occupation, but it is entirely another matter to see that he makes proper use of his training and is the self-supporting and independent individual that he was intended to be, and for which he was equipped. With this end in view, St. Dunstan's found it necessary to establish in Great Britain very comprehensive arrangements for the settling down, periodical visiting of, furnishing of raw material and selling of manufactured products, and in general supervising the personal and business details in connection with every man who has graduated from its classes. Faults in processes or methods which are so apt to appear from time to time, and which are so disastrous to success if not corrected in the early stages, are thus detected.

Canadian blinded soldiers who after graduating have settled down or who will settle down in Great Britain, will of course come under the benefits of this system, and will have no cause to worry as to their futures, so long as they are conscientious and careful about their work.

In Canada, however, the problem is quite a different one. There are less than 10 per cent of the number of men to look after, and these are scattered over probably fifty times as great an area. When, therefore, the graduate is prepared to settle down in his own locality, word is sent to the District office and a representative there endeavours to secure some proper location, if the man has not already a home to go to. Advice can be secured at any time from the officer in charge of the work in Ottawa, and interest is to as large an extent as possible created in the proper quarters where it is thought it will be of service to the man in question. It is, however, planned to make "Pearson Hall," an institution opened in Toronto by the Canadian National Institute for the Blind, which institute has also established a Dominion-wide organization for the carrying on of "after-care," the headquarters of the after-care arrangements in Canada, and to keep supplies of raw material on hand in suitable locations, and also a warehouse and sales room for the handling of manufactured articles.

A complete record is kept at the Head Office of the department of all blinded graduates, and some very interesting information is on file as to the success of these men in their chosen callings.

The number of Canadians who are reported to be suffering from blindness and defective eyesight so far discharged from the Canadian Army is 1,525, of whom 137 have lost sufficient sight to require re-training, 41 cases are under investigation and it

is expected that approximately 26 of these will be able to take re-training. Of the 178 cases which have been trained or are under investigation the following is a division:—

Loss of both eyes	25
Loss of right eye	24
Loss of left eye	18
Other visual disorders	111
Total	178

NOTE.—Of the total number of 178 cases above listed 82 are totally blind, or at best possess only a perception of light.

Of the 41 under investigation three have lost the sight of both eyes, four that of the right eye and five of the left, 29 other visual disorders.

NOTE.—Of the total number of 41 cases above listed 18 are totally blind, or at best possess only a perception of light.

Sixty-five men are undergoing training, 27 being at St. Dunstan's, and 38 in Canada. The disability of these men is as follows:—

Loss of both eyes	9
Loss of right eye	6
Loss of left eye	4
Other visual disorders	46
Total	65

NOTE.—Of the total number of 65 cases above listed 20 are totally blind, or at best possess only a perception of light.

These men are undergoing training as follows:—

Massage	11
Poultry farming and carpentry	9
Boots and mats	5
Piano tuning	3
General	17
Stenography	3
Carpentry	4
Vocal	1
Baskets and nets	4
Broom-making	5
Telegraphy	1
Rattan chair work	1
Rubber stock mixing	1
Total	65

UNDERAGE BOYS.

An extension of the vocational training privileges was granted in April, 1919, by which those who enlisted under the military age of 18 years might be trained in industry or in a technical school, college, university, business college, or in one of the department's training classes. The department was charged with the duty of the selection of those who appear to be eligible, and, by a recent enactment, they are paid the same rates of allowances as those granted to men who undergo re-training because of disabilities incurred on service.

It was realized by the department that a large number of these young men if they had continued their work would, in the course of time, have become skilled workmen and in a position of self-support and independence, but that the years they spent in the army were just those during which they should have been fitting themselves to earn their livelihood in the occupation for which they had prepared themselves.

It is recognized that it would be unfortunate if these men were forced into the ranks of unskilled labour, with an added handicap on account of the age at which they were starting. If, on the other hand, they could be trained under the guidance of competent instructors or carefully supervised industries their experience in war might be turned to advantage both to themselves and to the country.

From the commencement of this work to the 31st of December, 9,867 courses were approved, 1,085 of which were approved during that month; 7,389 men were undergoing training.

In addition to the work of training the disabled and boys who enlisted under 18 years of age, the Vocational Branch has been authorized to advance by way of loan to those disabled men who have been retrained and are in need of same, a sum not exceeding $500 for the purchase of tools and equipment necessary to establish them in their new occupation, such loan to be repayable within five years from date of issue without interest.

Also to advance by way of loan to those men who were disabled and who are in need of same, a sum not exceeding $500 to enable them to pursue any course of training or education that was substantially interrupted by war service, providing in all cases that the disability was of such a nature as to make such assistance necessary, and provided further that such men are not entitled to or have not taken training under the Department of Soldiers' Civil Re-establishment; all such loans to be repayable in five years without interest. The necessary machinery has been established throughout the country to handle this matter but at the present time no figures are available that will enable us to estimate the amount that would be advanced to disabled soldiers in this way.

AFTER CARE RESULTS.

In any enterprise conducted for gain, the results are finally measured by the profit and loss account. On the debit side is placed the expenditure, and set off against this on the credit side is the income, the balance being profit.

In industrial re-training, however, the debit side is ever present, but the only credit is the number of men stabilized in civil life. This result can never be measured in dollars and cents. In order, therefore, intelligently to administer the work of industrial re-training it was thought that the department should make a serious endeavour to find out what became of its graduates. It was also thought that it would be unwise to spend money on training men without making some effort to see that they took advantage of the training. The work could not be considered as finished until the man was stabilized in employment.

The most critical time for these disabled men is the first month or two after they graduate from training and return to wage earning. In order to meet these objects the follow-up and after-care department was organized. Information is thus gained regarding failures and faults, where improvements may be made, which courses are successful and which unsuccessful.

The practical success of an industrial retraining scheme for disabled soldiers can be determined only by a study of averages. Individual success, however brilliant, can never be taken as proof that the system is efficient, nor can individual failure condemn. Only after a careful study of all the records of men who complete their re-training during a certain time, men of different ages and disabilities, can any definite conclusion be arrived at.

The follow-up system was not put in force until the work had been in progress for one and a half years, and it was necessary to get in touch with men who had already graduated and left. This was done through the Pensions Board and their visitors, through writing letters to their addresses, and through the Great War Veterans' and other returned soldiers' associations.

It is believed that Canada is the only country to-day having a complete follow-up system for the graduates of industrial re-training.

The following, therefore, is a discussion of the results of industrial re-training only, based on the information gathered through the follow-up and after-care departments.

Up to December 31, 1919, 49,260 applications for re-training courses had been recommended to Ottawa by the Disabled Soldiers' Training Boards. Head office concurred in granting 42,679 courses with pay and allowances. Out of the balance of 6,581 5,505 were ineligible, 469 had not been recorded, and the remainder, 607, were waiting the result of further information or further medical treatment.

The 42,679 courses granted up to December 31, 1919, were distributed as follows:—

Courses deferred	472
Courses not accepted	1,728
Courses not commenced	3,962
Men in training	23,966
Courses completed	9,455
Courses discontinued	3,096
Total	42,679

"Courses not accepted" refers to men who have been granted training, but for some reason have declined to take advantage of it. In striving to find the weak points in the re-training system it would seem that discontinuance of training of 3,096 men might furnish the key to certain defects and therefore a study was made as to the disposal of these men who had discontinued their course. They were carefully examined and classified as follows:—

The number and percentage of men in each group are as follows:—

	No. of Men.	Per Cent.
1. To take positions in other lines than that for which they were training	726	23·45
2. Course cancelled on account of misconduct or bad attendance	397	12·82
3. Deceased	73	2·36
4. No apparent reason for discontinuance	724	23·39
5. Sick	257	8·30
6. Gone abroad	344	11·11
7. Training allowance insufficient	36	1·16
8. Domestic troubles	65	2·10
9. No information	231	7·46
10. Taking further course	13	·42
11. To go on land	91	2·94
12. Re-enlisted for light duty (old cases)	51	1·65
13. Pending information	88	2·84
Total	3,096	100

On December 31, 1919 there were 3,962 men approved for training who had not then commenced.

On September 30, 1919, 6,923 men had completed their training. The table herewith shows a summary of the Follow-up reports from graduates from all units up to September 30, 1919. The 6,923 graduates have been divided into:—

	Number	Per Cent.
1. Following lines of training	4,166	60·18
2. Following other lines	1,317	19·02
3. Unemployed	389	5·62
4. Unable to trace	295	4·26
5. Awaiting information	368	5·32
6. Gone abroad	169	2·44
7. Sick	190	2·74
8. Deceased	29	·42
Total	6,923	100

Among the 19·02 per cent who are following other lines of occupation, will be found a number of men who went back to their old occupation. The fact should not be lost sight of that a number of men are awarded courses, who, at the time their cases come up for consideration, sincerely believe that they cannot return to their former work. They are not malingerers, but their belief is due to a state of institutionalism induced by their life in the army and in the hospital. After a few months of training with the department they find that their idea is false and go back to their old occupation, but if they had not been trained by the department they would have persisted in their former state of mind, and very likely have sunk lower and lower in the social scale.

Other men go back to some former occupation different from that given when they were interviewed. Others find remunerative employment in other lines of work for which little or no training is necessary.

Some men come from the hospital unable immediately to follow the work in which they were engaged before the war, for the reason that while the doctors have done everything possible for them, their convalescent period is not yet over and they must be given work in the meantime, otherwise their disability would increase through idleness and they might become confirmed cripples. Having followed a course of training they have become physically fit and return to their previous or some other occupation. These all fall within the 19·02 per cent and are regarded by the department as successful.

It is significant that while these men may be following some other occupation than that for which they were trained, the fact remains that they are in employment, and that when they came to us they sincerely believed that they could not follow any gainful occupation.

Of the men trained 5·62 per cent are unemployed. This table covers men who have graduated up to September 30, 1919, and on whom follow-up reports have been received up to December 31, 1919. Although 5·62 per cent are still unemployed some will no doubt soon secure positions. The Department grants an extra month's allowance to tide over this period. Others are what might be called unemployable, those who in civil life did not want to work and never would, while with others we have failed in our endeavour to train them.

The department has been unable to trace 4·26 per cent of the total number of graduates. In explanation of this, it should be said that a considerable number of men leave as soon as their courses are completed, without giving an address. They are under no obligation to report their movements to the department; they leave for the United States or other provinces. Others have been lost track of through the lack of a follow-up system in the early days of the work, but are gradually being found.

However, the mere fact that men are employed is not a sufficient measure of the success or failure of industrial re-training. It is the aim of the department so to train these men that they will receive the full going wage in the occupation in which they are placed. Also, this wage must be sufficient to keep them respectably and comfortably in the station of life where they find themselves. The men should be put in as good a position, or better, from the wage earning standpoint, as they were before the war, notwithstanding their disablement, and without regard to any pension they may receive. The analyses made are satisfactory in this respect, showing that there are considerable average gains among the graduates over pre-war earnings.

The training of handicapped soldiers is new; it has never been done before the present war. The organization and carrying on of the work was undertaken under war conditions at numerous points in Canada, which has an area of 3,729,665 square miles. The results are far from perfect—no system of this kind can ever be perfect; it is always in the process of development. The results, however, go to show that from now on, few if any disabled soldiers need despair of being able to place themselves on a self-sustaining basis, and may become self-respecting, producing members of society.

COSTS AND STATISTICS.

Although it is necessary, from the administrative standpoint, to know the cost of doing certain work, it must also be borne in mind that the efficiency of the Vocational Branch cannot be measured by the cost, because in the last analysis the purpose is to re-train disabled soldiers, and not manufacture articles or material at a minimum cost. However, in order that all equipment and supplies furnished may be handled judiciously and conserved as part of the nation's wealth, it is necessary that a very strict supervision be placed upon their use and disposal, so that the losses of supplies through careless workmanship or general shortages may be minimized, and the too rapid deterioration of equipment may be controlled.

The unit used to measure the costs is the cost per month per man taking training. Included in these costs, however, are a number of items that should not be charged to training, but which cannot be readily separated.

In addition to a large number of interviews with men who are granted courses, the Vocational Branch interviews all men discharged through the invalided section of the military discharge depots. Since the inception of the work the branch has interviewed over 62,138 men in person, as to their need for re-training. The expense of the interviewing and clerical work in connection with this work is carried by the cost of training.

Included in these costs also is the cost of training the ward aides and administering their work. None of the men who take work in the wards is enrolled as a student. The full cost of training the 270 young women for this work has been charged to "D" unit.

The costs include the salaries of the Vocational Medical Advisers and their office expenses, also the costs of the industrial surveys as well as the costs of the after-care department.

It is impossible to compare these costs with those in any other educational system on account of the expense of interviewing, inspecting, medical examination, industrial surveys, after-care and ward aid work, and also because the individual nature of the work done for each man is not done in high school, technical school or university. The system of individual instruction and flexible syllabi is nowhere carried to the same extent. This entails fewer students to each instructor and a greater executive staff. This system also carries the expense of factory inspection, industrial surveys and medical work, not carried by any other system, all of which is included in the cost per month per man.

The remarkable expansion of the work has necessitated considerable expense for organization, and since the work was so new a great deal of research and experiment had to be undertaken. This is all carried in the unit costs.

A careful analysis of all expenditures in connection with training show that the monthly cost of training per student, exclusive of pay and allowances, is $19.46.

It is very difficult to obtain information as to the costs of carrying on work in educational institutions. However, the Bureau of Education of the Department of Interior, United States Government, has made some investigations into the costs of operating universities and agricultural colleges in the states of Washington and Iowa. In Bulletin No. 19 issued by that Bureau in 1917, on page 110, are found some very interesting figures touching the costs in these institutions. The costs given in this table cover all current operating and and administrative expenses, but not capital cost, and are comparable with those given in table three of this section. The costs in these institutions for the school year for each man based on the average attendance are as follows.—

	$ cts.
State University of Iowa	271 00
Iowa State College of Agriculture and Mechanical Arts	271 00
University of Washington	192 77
Washington State College	289 79

The average of these four is $257.26 per man per school year.

The report does not state the length of the school year, but it is probably seven months. If, however, it is taken as eight months the average cost per month per man would be $32.16 which is much higher than the average cost in the Vocational Branch of the department.

It must be remembered that these colleges do not carry the charges for interviewing, medical care and examination, industrial surveys, after-care, transportation of students, ward aides and the training of certain instructors, as do the costs of the Vocational Branch of the Department of Soldiers' Civil Re-Establishment.

DEPARTMENT OF S. C. R., OTTAWA, VOCATIONAL RECORDS OFFICE.

List of occupations for which disabled soldiers and minors have been training or are being trained, December 31, 1919:—

1. Agriculture
2. Adding Machine Repairs
3. Auto Painting
4. Artificial Limb Making
5. Art Metal Work
6. Armature Winding
7. Advertising
8. Auto Mechanic
9. Auto Tire Repairs
10. Air Brake Mechanic
11. Architecture
12. Architectural Drafting
13. Aeroplane Manufacturing
14. Aerated Water Manufacture
15. Auto Salesman
16. Auto Upholstering
17. Auto Truck Driver
18. Accountant
19. Animal Husbandry
20. Assaying
21. Asbestos Making
22. Auctioneering
23. Art Lead Glazing.
24. Bank Messenger
25. Bicycle Repairing
26. Battery Making
27. Bird Cage Making
28. Boat Building
29. Book-keeping
30. Barbering
31. Billiard Table Repairs
32. Bronze Moulding
33. Building Construction
34. Boiler Inspector
35. Battery Repairs and Manufacturing
36. Braille
37. Brick Making
38. Brush Back Boring
39. Brush Making
40. Boiler Laying
41. Brass Finisher
42. Brass Bed Assembling
43. Box Factory Foreman
44. Bee-keeping
45. Broom Making
46. Basket Making
47. Blacksmithing
48. Book Illustrating
49. Butter Making
50. Butchering
51. Building Inspector
52. Baking
53. Book-binding
54. Brass Novelties
55. Camera Assembling and Repairs
56. Chemistry
57. Carriage Painting
58. Civil Engineer
59. Cheese Making
60. Cable Telegraphy
61. Cable Testing and Splicing
62. Cabinet Making
63. Commercial
64. Concrete Construction
65. Coremaking
66. Carpet Weaving
67. Civil Service
68. Carpentry
69. Commercial Designing
70. Central Telephone Office Work
71. Cash Register Assembling
72. Cylinder Press Feeder
73. Cloth Weaving
74. Commercial Illustrating
75. Commercial Art
76. Confectioner
77. Comptometer
78. Chiropody
79. Clock Repairing
80. Cigar Making
81. Cornet Playing
82. Cleaning and Pressing Clothes
83. Cartooning
84. Compositing
85. Cooking
86. Cotton Spinning
87. Dancing
88. Dry Goods Salesman
89. Drafting and Estimating
90. Dairying
91. Dyeing
92. Dentistry
93. Drafting (Electrical)
94. Drill Press Operator
95. Die Polishing
96. Efficiency Expert
97. Estimating and Plan Reading
98. Electrical Appliance Testing
99. Electric Light Station Operator
100. Electric Locomotive Engineer
101. Electric Light Wiring
102. Electric Light Meter Mechanic
103. Electric Light Sub-station Operator
104. Electric Fixture Making
105. Electric Fixture Assembling
106. Electric Fixture Repairing
107. Electrical Engineering
108. Electric Welding
109. Electric Winding and Wrapping
110. Electric Switchboard Operator
111. Electric Wiring
112. Elevator Operation
113. Electrician
114. Embalming

LIST OF OCCUPATIONS, ETC.—*Continued.*

115. Engraving
116. Farm Mechanics
117. Farm Carpentry
118. Farm Machinery Repairs
119. Finance
120. Floriculture
121. Floral Design
122. Fruit and Vegetable Drying and Canning
123. Fur Cutting
124. Farrier
125. Furniture Polishing
126. Farm Traction Operation
127. Factory Clerk
128. Forestry
129. Food Inspector
130. Fancy (Wire) Work
131. French Polishing
132. Flour Milling
133. Fire Insurance Agent
134. Fountain Pen Maker
135. Furnace Installation
136. Greenhouse Work
137. Gas Engineering
138. Gas Fixture Making
139. Gas Generating
140. Gas Stove Fitting
141. Glass Cutting
142. Garment Designing
143. Garment Cutting
144. Grain Buying
145. Grain Elevator Operator
146. Glove Weaving
147. Gardening
148. Grain Inspector
149. Gas Tractor Engineer
150. Glove Making
151. Gunsmithing
152. Gold Pen Making
153. Grocery Business
154. Golf Accessories
155. Hair Dressing
156. Hotel Management
157. Hat Blocking
158. Hat Making
159. Highway Engineering
160. Hydro Inspector
161. Hardware Salesman
162. Hospital Technician
163. Harness Making
164. Harness Fitting
165. Horticulture
166. Heating Plant Operator
167. Hog Raising
168. House Painting
169. Harness Repairing
170. Investigator
171. Interior Decorating
172. Iron Moulding
173. Journalism
174. Jeweler
175. Jewelry Repairs
176. Janitor
177. Joiner
178. Knitting Machine Operator
179. Knitting Machine Repairing
180. Lumber Surveying
181. Lumber Yard Manager
182. Locomotive Engineer
183. Locomotive Fireman
184. Lamp Trimming
185. Linoleum Laying
186. Lip Reading
187. Life Insurance Agent
188. Locksmith
189. Log and Lumber Scaling
190. Landscape Gardening
191. Lens Grinding
192. Leather Novelties Mfg.
193. Lead Glazing
194. Linotype Operator
195. Lithographing
196. Law Course
197. Librarian
198. Machine Floor Finishing
199. Manual Training
200. Metallurgy
201. Machanical Equipment of Buildings
202. Millwright
203. Motor Cycle Assembling and Repairs
204. Multicolor Press Operation
205. Medicine
206. Meter Reading
207. Metal Pattern Maker
208. Metal Spinner
209. Marble Cutting
210. Mechanical Drafting
211. Machine Shop Practice
212. Motorman
213. Milling and Assaying
214. Mining Engineering
215. Monotype Casting
216. Milk Testing
217. Metal Polishing
218. Moving Picture Operation
219. Mining
220. Machinist
221. Mechanical Dentistry
222. Metal Enamelling
223. Moving Picture Photographer
224. Motor Construction
225. Massaging
226. Mechanical Engineering
227. Magneto Repairs
228. Multigraph Operator
229. Marine Engineer
230. Meat Inspector
231. Municipal Secretary
232. Machine Buttonhole Work
233. Metal Drill Work
234. Mattress Making
235. Machine Wood Work
236. Navigation
237. Naval Architect
238. Nautical Instrument Repairs
239. Oil Refining
240. Optometry
241. Office Equipment Repairs
242. Optical Work
243. Oxy-Acetylene Welding
244. Ornamental Iron Work
245. Orthopaedic Boot Making
246. Ocean Cable Telegraphy
247. Pulp and Paper Manufacture
248. Painter and Decorator
249. Pipe Making
250. Plasterer
251. Photography
252. Poultry Raising
253. Printing
254. Plumbing
255. Plumbing Supplies Assembly
256. Pharmacy
257. Piano Tuning
258. Piano Polishing and Finishing
259. Piano Repairs
260. Piano Sounding Board Mfg.
261. Piano Hammer Making
262. Picture Framing
263. Paper Box Making
264. Prosthetic Dentistry
265. Power Plant Engineering
266. Pattern Making

LIST OF OCCUPATIONS, ETC.—*Concluded.*

267. Pressman
268. Photo Engraving
269. Pressed Metal Work
270. Paper Hanging
271. Pickle Making
272. Paper Novelty Manufacture
273. Rule Graduation
274. Rodentarian
275. Rubber Turning
276. Railway Clerk and Accounting
277. Ring Making
278. Radiographing
279. Railroad Station Work
280. Rubber Tire Repairing
281. Reed Furniture Making
282. Railroad Track Inspector
283. Reporting
284. Railway Drafting
285. Sculpture
286. Silvering Mirrors
287. Social Service Secretary
288. Sugar Refining
289. Shoe Making
290. Shoe Cutting
291. Shoe Repairing
292. Sheet Metal Work
293. Stencil Cutter
294. Steel Analysis
295. Scientific Course
296. Steam Engineer
297. Switchboard Operator (Telephone)
298. Switch Board Installing
299. Stenography
300. Shipping Clerk
301. Stone Drafting
302. Steel and Cement Construction
303. Soldering
304. Street Car Repairs
305. Surveying
306. Steam Boiler Inspector
307. Silversmith
308. Stationary Engineering
309. Sign Painting
310. Sewing Machine Repairs
311. Ship Building
312. Steel Stamping
313. Silver Polishing
314. Steel Letter Cutting
315. Sign and Card Writing
316. Storekeeper
317. Sanitary Inspector
318. Seed Inspector
319. Stamp Making
320. Stove Moulding
321. Saw Fitting
322. Steam Fitting
323. Ship Drafting
324. Ship Fitting
325. Sheet Metal Drafting
326. Stationery Salesman
327. Stone Planer
328. Sash and Door Manufacturing
329. Scale Repairs
330. Slaughtering Animals
331. Saxophone Playing
332. Salesmanship
333. Sheep Herding
334. Surgical Appliance Manufacture
335. Tem Plate Making
336. Textile Manufacture
337. Tire Manufacture
338. Toy Making
339. Tinsmithing
340. Tile Setting
341. Tool Making
342. Taxidermy
343. Telegraph Cable Splicing
344. Time Keeping
345. Telegraphy (Railroad and Commercial)
346. Telephone Installation
347. Telephone Repairs
348. Telephone Lineman
349. Typesetter
350. Truck Gardening
351. Theology
352. Tailoring
353. Typewriter Repairs
354. Touch Typing
355. Trunk Making
356. Trap Drummer
357. Teachers' Course
358. Umbrella Repairs
359. Upholstering
360. Undertaking
361. Vinegar Making
362. Veneering
363. Violin Playing
364. Vulcanizing
365. Veterinary Work
366. Watchman
367. Weaving
368. Wheelwright
369. Wire Work
370. Wood Working
371. Watch Repairing
372. Veneer Lathe Operating
373. Window Dressing
374. Wire Cable Making
375. Wooden Shoe Making
376. Wood Carving
377. Wireless Telegraphy
378. Wood Polishing
379. Wire Bed Spring Manufacturing
380. X-Ray Operating

REPORT ON INFORMATION AND SERVICE BRANCH.

Submitted by Major L. L. Anthes, Director Information and Service Branch.

INTRODUCTION.

The sudden cessation of hostilities in November, 1918, brought the Government face to face with the problem of assimilating into the industrial life of the Dominion, at short notice, about 350,000 men who had been absent on service for periods up to nearly five years.

No adequate machinery for this purpose was in existence. There were only twelve Dominion-Provincial Employment Offices in Canada, and the sporadic efforts of voluntary organizations would have been totally inadequate to cope with such a volume

of work; it was imperative, therefore, to create without delay some means of handling this great number of men expeditiously and efficiently.

A new branch of the Department of Soldiers' Civil Re-Establishment was accordingly formed. It was called the Information and Service Branch, and became operative in January, 1919.

Major L. L. Anthes, Chairman of the Toronto Branch of the Canadian Manufacturers' Association, and Mr. T. A. Stevenson, secretary of the Toronto Trades and Labour Council, were summoned to Ottawa to consult as to ways and means of re-establishing the men shortly to be demobilized, and later were appointed director and assistant director of the Information and Service Branch.

The first act of the Information and Service Branch, while consolidating its organization in Canada, was to send out a questionaire to be filled in by every soldier overseas. These forms were distributed with great thoroughness among the various Canadian camps in Germany, Belgium, France and the British Isles, and on completion were returned to Canada, where the information was collated and tabulated for reference. By March 1 it was possible to form a fair working estimate of the probable distribution of the returning men by trades and territorial areas.

CO-ORDINATION OF EXISTING MACHINERY.

After a series of conferences with the Repatriation Committee, it was decided to extend the existing system of Free Government Employment Offices. This decision was put into operation under the Employment Offices Co-ordination Act, and more than eighty new offices, administered by the various Provincial Governments, under the supervision of the Federal Department of Labour, were established at tactical points throughout the Dominion. These offices are shared by the Employment Service of Canada and representatives of the Information and Service Branch. These district representatives are charged with the responsibility of attending to all the problems of the returned men applying to them, and ensuring that they receive preference for all positions available at the Employment Office.

CREATION OF ORGANIZATION.

In co-operation with various Provincial Governments and the Federal Department of Labour, the chain of employment offices was quickly extended through the efforts of this branch, until every city in Canada had one or more Free Government Employment offices. Special arrangements were made with the Federal Department of Labour and with certain of the Provincial Governments, particularly that of Ontario, whereby Information and Service Offices were opened at places which did not have a regular employment office. These Information and Service Offices, by agreement, became part of the chain of Employment Offices of the Employment Service of Canada, the representative of this branch in charge of the office being also recognized by the Provincial Government as the representative of the Employment Service of Canada. These "one man offices" were extended also throughout the Maritime Provinces, Ontario, Manitoba and Saskatchewan. In Quebec it was impossible to make any similar arrangement and in spite of all efforts to co-operate with the Provincial Government, it early became apparent that the work of the Information and Service Branch could not be successfully carried on unless separate offices were established. A separate Employment Office was accordingly established in the city of Montreal, and it has been continuously operating sice early in the year. The work done in that office and the results accrued, when compared with the results secured in the Employment Offices of the Provincial Government, amply justify the decision to establish the separate office.

In British Columbia it first became necessary to establish offices of the Information and Service Branch through the province, pending the time that the Provincial

Government was in a position to proceed with the provincial organization. As soon as the Provincial Government of British Columbia had organized and extended the provincial chain of employment offices, those formerly operated by the Information and Service Branch were merged with those operated by the Provincial Government wherever they existed in the same city or town.

The organization of a professional and business section was not received enthusiastically by any provincial government, so that in the cities of Montreal, Toronto, Winnipeg and Vancouver, special offices were opened by the Information and Service Branch for the sole purpose of finding employment for this class of men.

ORGANIZATION.

The unit service officers organization consists of the district representatives in the employment offices within his unit, and local representatives at various points throughout his territory. Each of the district representatives has a number of local representatives scattered through the smaller towns within his zone, working on a part-time basis, who attend to the inquiries and problems of men in their vicinity, places those who are unemployed, and indicates to the district representatives such opportunities for employment as they are unable to fill themselves. Thus the congestion of unemployment in the larger cities may be relieved by the diffusion of workers among the smaller centres.

In order to connect unplaced workers in one district with unfilled vacancies in another, a system of interprovincial clearance bulletins has been established, by which the supply of labour is adjusted to the demand. An arrangement was made with the railway companies by which a special rate of 1 cent a mile was made available for such inter-unit transfers of workers. In order to cope adequately with the different classes of applications, it became necessary to add to the general employment section, dealing with skilled and unskilled labour, a professional and business section for men with professional, business and technical training, and a handicap section for the disabled or subnormal. These were created as the necessity for them arose.

All phases of the work within his unit are under the control of the unit service officer, who acts under the instructions of the Director of the Information and Service Branch. The director formulates the policy of the branch and lays down the procedure to be followed. The head office of the Information and Service Branch is responsible for the co-ordination of the various units, and the relations of the branch with the Federal Department of Labour, which controls the employment service of Canada.

FUNCTIONS.

The responsibilities of the Information and Service Branch are only limited by the needs of the returned men. On returning to civilian life, ex-members of the forces are faced with many unforeseen problems which require expert and sympathetic attention in order to facilitate their resumption of citizenship. Many men are faced with grave problems arising from their absence from home and normal occupation for such a long period. Much time has been spent in the adjustment of business, financial and family affairs, in which the Information and Service Branch has been the only organization able to render persistent, effective service. Advice on such subjects as the opportunities for employment, the settlement of claims for gratuity, pay and allowances, working pay, pensions, refund of transportation, vocational training, medical attention, land settlement, housing, industrial loans, has been given to hundreds of thousands of men. Many men, who through the interruption of the war, have had to commence life all over again, have sought advice as to new lines of endeavour, and positions have had to be found for them according to their qualifications. Another class of man, damaged mentally or physically by war service, has had

to be fitted into new positions, and his efforts carefully followed up and assisted for considerable periods, in order to insure his permanent re-establishment. The unsettling influence of the war on certain temperaments has had to be combatted. Employers have not invariably found that the returned man has settled down at once, and often unremitting tact and influence has had to be brought to bear, to induce employers to be patient with those who have not immediately adjusted themselves to new conditions. This branch has acted as an intermediary between capital and labour in the adjustment of industrial disputes, and at least one strike has been averted through such efforts. Through the dissemination of correct information and such assistauce as is briefly outlined above, this branch has proved a tranquillizing factor in the industrial life of the Dominion, and in calming unrest amongst the returned men themselves.

METHOD OF WORK.

With regard to the information and assistance given to ex-members of the forces, and the special assistance rendered them in connection with their domestic, financial and personal problems, as many of these cases as possible are settled locally. Where additional assistance is required, they are passed by the district and local representatives to the unit service officer, and if settlement is still not possible, they are referred to the head office at Ottawa, which deals with other departments of the Government, the Imperial and Foreign Government, or any other agency from which assistance may be obtainable.

Positions are obtained by maintaining a close liason between the branch offices and employers. Canvassers are employed to solicit vacancies for all classes of workers, which orders are filled from the list of unplaced men. After a man has been placed, he is followed up to ascertain if he is suitable to the employer and if the conditions of service are equitable from the man's point of view. This follow-up work has produced the most valuable results in adjusting minor difficulties as between employers and employees, satisfying the employer that this branch is out to render service in finding him suitable workers, and nipping in the bud incipient unrest among some of the returned men over real or fancied grievances.

Special attention has to be paid to the case of the handicapped worker. It is usually necessary to take such a man to his prospective employer to commence with, in order that the job may be thoroughly understood. As this type of man is usually labouring under a sense of inability to cope with his task through his disability, the follow-up work in this case must be intensive, in order to prevent him from losing heart and failing to make good.

At the outset, the work of the Information and Service Branch was seriously handicapped through the absence of any accurate and extensive survey of industrial openings. Accordingly, every District Representative was instructed to make a careful survey of the industrial possibilities in his immediate district. A typical survey is that made in Ontario during the last summer, for the purpose of estimating the probable industrial openings during the coming winter. On receipt of the survey in question, the Director interested private individuals and associations throughout Ontario to secure further orders for firms which would otherwise have been likely to reduce their activities during the winter. As a result of the information obtained through these surveys, many industries have been given the extra stimulus which was necessary to enable them to continue operating at full capacity.

New avenues of employment have been created in certain lines of business. In the lumbering and shipbuilding industry in British Columbia and in many other branches of work, through special endeavours on the part of this branch, returned men have largely displaced oriental and foreign labour. To effect this, special skilled men have been employed to study various angles of the industrial situation and to assist firms in solving the problems connected with the substitution of Canadian for

foreign labour, without disorganizing their plants. In British Columbia and other centres, such efforts have met with marked success. Special service officers have also been detailed to protect the interests of the returned men in the fishing, canning and lumbering industries, and by successfully raising the conditions of labour and rates of pay, this substitution is being gradually affected.

In Winnipeg, one of the largest packing houses has replaced alien employees by 200 returned men, with the result that the production has increased to such an extent that wages in this plant have gone up in proportion. When this firm was first approached by a canvasser of the branch, the management was distinctly diffident about making such a drastic change in the personnel, but experience has shown that the ex-service man is not only equal but superior to the alien labourer.

FEDERAL EMERGENCY APPROPRIATION.

In December the distribution of money allocated by the Government under the Federal Emergency Appropriation was entrusted to the Canadian Patriotic Fund, and commenced at the beginning of Christmas week. Applicants who were registered for work with the Information and Service Branch for whom no positions were immediately available, and who stated that they were in need, were referred to the Canadian Patriotic Fund so that their cases might be investigated, and if necessary, assisted from that appropriation, a certificate to that effect being furnished the applicant by this branch. This involved a large increase of work, and a special temporary staff had to be engaged to handle it. A considerable number of applications were received from men who had exhausted their War Service Gratuity, and who, for that or other reasons had not previously registered with this branch. Many applications were also received from men, who, while they were still employed, claimed that they were in receipt of insufficient remuneration to provide their families with the necessities of life. Although the scheme was only put into operation on December 22, yet to the end of the month about 11,000 such certificates were issued.

RESULTS.

The foregoing presents the situation when the Information and Service Branch was created to handle problems assigned to it, and indicates the circumstances surrounding the creation of its chain of offices from coast to coast. At this date it has 102 employment offices and 63 part-time offices. These are administered by the 16 unit service officers, who have their own headquarters as distinct from the Employment Offices.

The organization of the staff of the branch presented a difficult problem in itself. A chain of offices was created practically overnight, which had to be staffed with men without any previous training or experience in the work they were called upon to do. Ex-members of the forces were selected for their previous business training, enthusiasm and common sense. Conferences of these representatives were held in every unit and the work and methods explained to them. It was laid down that the same up-to-date business methods which would make a commercial house a success had to be applied to the work of the Information and Service Branch. Unit heads of the Information and Service Branch were called to head office for conferences whereat a mutual exchange of ideas took place, and under the personal guidance of the Director, the various methods of improving the service discussed. The Director's time has been continuously taken up in travelling from one unit to another to straighten out weak points, not only of the Information and Service Branch, but also the work of the Employment Service of Canada, as it affected the interests of returned men.

The number of inquiries and special cases dealt with amount to over 700,000, involving, in addition to the personal interviews, a considerable

amount of correspondence. There were nearly 130,000 applications for employment, of which upwards of 111,000 positions were found for returned men. The attached statistical statement gives these results in detail.

Schedule "A" attached.—Shows an analysis of the placements of returned men by industries.

INFORMATION AND SERVICE BRANCH.

(SCHEDULE "A").

Statement showing the distribution of placements to the 31st of December, 1919, by industrial groups.

		Number.	Percentage.
Farming		7,535	6·8
Logging		1,093	0·9
Mining		2,568	2·3
Fishing		213	0·2
Manufacturing		28,766	25·9
Textile products	377		
" spun, knit and woven	219		
" cut up and sewn	300		
Rubber products	1,067		
Pulp and paper products	952		
Lumber and its products	5,270		
Edible plant products	1,717		
Other plant products	472		
Leather and leather products	508		
Edible animal products	965		
Other animal products	19		
Iron and steel products, hardware	4,862		
Non-ferrous metal products	276		
Stone, clay and glass product	566		
Chemical and allied products	932		
Mineral products	908		
Light, heat and power	1,922		
Vehicles (land)	1,480		
Vehicles (water)	2,177		
Farm equipment	713		
All others	3,062		
Construction		5,971	5·4
Railway	170		
Other	5,801		
Transportation and storage		13,526	12·2
Water transportation	1,558		
Rail transportation	10,949		
Local transportation forwarding and storage	1,019		
Communication, trade, finance		13,418	12·1
Banking and investment	280		
Insurance	264		
Others	12,874		
Services		23,136	20·9
Domestic and personal	2,511		
Recreational	1,104		
Professional	603		
Civic	18,918		
Miscellaneous		14,775	13·3
Labour	2,557		
Unclassified	12,218		
Grand total		111,001	100·0

OTTAWA, January 26, 1920.

STATISTICAL STATEMENT OF RESULTS OF WORK OF INFORMATION AND SERVICE BRANCH, TO DECEMBER 31ST, 1919.

Province.	No. of Employment Offices.		Applications for Employment.	Placements by Sections.				Percentage of Placements to Applications.	Certificates of Relief under F.E.A. Granted.	Inquiries and Special Cases Dealt With.
	Regular.	Part Time.		General.	P. & B.	Handicap.	Total.			
								%		
P.E.I.	1	1	803	766	2	0	768	95·6	8	4,936
N.S.	5	10	3,601	3,299	15	6	3,320	92·2	1	15,640
N.B.	6	5	5,328	5,003	13	8	5,024	94·2	29	16,846
Quebec	7	0	21,398	14,950	373	27	15,350	71·7	4,168	68,650
Ontario	39	31	47,887	39,880	1,196	266	41,342	86·3	5,616	269,952
Man.	9	2	11,313	9,419	437	108	9,964	88·1	480	129,214
Sask.	9	0	5,871	5,266	96	9	5,371	91·4	318	44,732
Alta.	9	0	12,907	11,562	223	138	11,923	92·3	574	16,199
B.C.	17	14	18,758	17,444	462	33	17,939	95·5	327	134,943
Canada	102	63	127,866	107,589	2,817	595	111,001	86·7	11,521	701,114

REPORT ON CHIEF INSPECTOR'S BRANCH.

Submitted by C. G. ARTHUR, *D.S.O., Chief Inspector.*

The Chief Inspector's Branch of the Department of Soldiers' Civil Re-Establishment is in charge of personal services to all patients undergoing treatment, with the exception of medical attention.

The officers chosen to carry out this work throughout the units in Canada have been selected with great care. It was necessary to have returned soldiers as far as possible, who would be able to appreciate the viewpoint of the returned men and who would act as their friend and assist them in every possible way in settling their troubles.

The general administration throughout the units is in the hands of assistant directors, who are responsible to the deputy minister, and perform certain duties in respect to the Chief Inspector's Branch, as follows: The care of records and documentation; awarding of pay and allowances for patients and their dependents; care, apart from medical treatment, of the insane and of the members of the forces from within the Empire and Allied Countries, with whom reciprocal arrangements have been made; clothing, the payment of war service gratuity for men on the strength of the Department of S. C. R., discipline in institutions operated by the Department of S. C. R., the proper notification of next of kin in the case of death of patients and the proper burial of deceased patients, transportation, passenger and freight, canteens and chaplain services.

Record of all men who come on the strength of this department are kept up to date by a system of daily orders. All documents which may be required regarding a man's previous history are obtained from various sources and can be sent, if available, upon application from the assistant director.

Former members of the forces who require treatment and have a disability due to or aggravated by service are placed on pay and allowances at the same rate which they were receiving for the rank they held on discharge or demobilization. Their dependents are also paid according to schedule as laid down in Order in Council P.C. 387.

Following representations made by this department, the care and treatment of former members of the C. E. F. suffering from insanity, or who are mentally deficient, was placed with the Department of Soldiers' Civil Re-Establishment, under authority

of Order in Council P.C. 1993. Dependents of insane ex-members of the forces are also paid allowances if the disability is due to or aggravated by service.

Patients on the strength of the Department of S. C. R. for a period of three months or over are furnished with a free issue of clothing which will be renewed at stated intervals and patients who are not able to avail themselves of this privilege can secure clothing on the repayment basis.

Arrangements were made whereby all men who were discharged direct from the Department of Militia and Defence to the Department of S. C. R. for treatment prior to October 1, 1919, such period of treatment should be counted toward a man's period of service in the computation of his war service gratuity.

All patients on the strength of the Department of Soldiers' Civil Re-establishment entitled to war service gratuity will be paid same on the completion of treatment by the Department of S. C. R. in a manner similar to that used by the Department of Militia and Defence.

In order that patients in sanatoria and other institutions may receive a maximum of benefit from the treatment given them, it is necessary that proper discipline be maintained. This is done by the assistant director's representatives in such institutions.

In case a patient on the strength of the Department of Soldiers' Civil Re-establishment dies, notification is immediately sent his next of kin. If in Canada or the United States, by the assistant director of the unit, if in the British Isles, notification is sent by the Chief Inspector. Fitting burials are always supplied, and these as far as possible conforming to the wishes of relatives or friends when so expressed. Letters of condolence go forward to next of kin in all cases.

The personal effects of a deceased patient are taken care of by the Assistant Director until advised by the Director of Militiary Estates as to their proper disposal.

The Department of Soldiers' Civil Re-establishment has made arrangements with the Canadian Passenger Association whereby this department issues its own books of transportation and freight warrants over the signature of responsible officials for the necessary transportation. This procedure provides direct control with regard to the issuing of warrants and direct payment of accounts.

Where necessary, canteens are in operation in institutions controlled by the Department of Soldiers' Civil Re-establishment. These are operated purely for the benefit and convenience of the patients in such institutions. The system of accounting is complete and monthly returns are submitted to the Chief Inspector.

Under the general direction of chaplain services, Department of Militia and Defence, chaplains are stationed in every unit. Their work is to provide spiritual ministration, visit the sick and convalescent, to uphold the ideals of Canadian citizenship, to co-operate with all social agencies, and to render personal service wherever possible by assisting the returned man and his dependents.

The foregoing is a resume of the work carried on by the chief inspector's branch. Every means has been taken to administer this branch of the work with due regard to effieiency and economy.

REPORT ON THE DIETARY BRANCH

Submitted by Miss V. M. Ryley, *General Organizing Dietitian*

In the administration of a hospital the provision of suitable food is second only to efficient medical and surgical treatment, as without it the latter fails to secure adequate results.

The military system of rationing patients in hospitals was adopted by the Military Hospitals Commission, until it was found that a large amount of unnecessary waste resulted, and that the meals were not as appetizing as they should be for

invalids. It was decided, therefore, to ask the Head of the Household Science Department of the University of Toronto to prepare menus covering a thirty-one-day month, providing for the proper number of calories, but the following objections were pointed out:—

1. Definite menus do not permit the hospital to take advantage of local markets or foods available only at certain seasons in the year.

2. A menu means little, the chief thing is how is the food prepared. For example—bread pudding is delicious when well prepared, but very unattractive if made as most cooks prepare it—so with many other foods. Who would oversee the preparation of this specified menu?

3. Even if the food were cooked correctly, who would see that it was served properly, hot or cold, in correct quantities and attractively?

4. What about the food served to patients on special diets, where a doctor's prescription must be followed? Who would be responsible for preparing this scientifically:

After fully discussing the above questions, it was decided to install dietitians for the following reasons:—

1. Economic.
2. Æsthetic.
3. Scientific and medical.

I. ECONOMIC REASONS.

(*a*) *Selection of the Menu.*—A capable dietitian will save a large institution thousands of dollars in a year by wise and intelligent menu building. She will select foods which give good results from a nutritive and æsthetic standpoint, but are reasonable in price; cheaper foods can be served frequently by being prepared in a variety of ways.

(*b*) *Supervision of the Preparation of Food.*—Large sums of money can be saved by seeing that all foods sent to the kitchen are prepared or cooked according to the finest methods.

(*c*) *Supervision of the Service.*—This is equally important with (*a*) and (*b*), as hundreds of dollars can be saved by seeing that moderate helpings are served. This does not mean stinting, as all are welcome to second servings, but the elimination of waste; for example, thickly carved meat is less attractive but uses more meat, a slice 20 per cent thinner on a $2,000 meat bill would mean a saving of $400. Often if a good carver leaves and is replaced by an inexperienced man a meat bill will rise several dollars a day until the new man is trained to carve to advantage.

(*d*) *Saving in the Number of Employees Required.*—An efficient dietitian will usually run a large dietary department with less help than when a department is managed by an inexperienced superintendent who has not been trained to make out a work plan to conserve labour.

(*e*) *Elimination of Waste.*—Elimination of waste in every respect, whether waste in food, waste in service, waste in fuel, or waste in other supplies.

II. ÆSTHETIC REASONS.

Aside altogether from the important economic reasons a competent dietitian will see that the meals are attractive, selecting pleasing combinations, securing variety, having food well flavoured, and seeing that it is served at the right temperature—either hot or cold.

In trying to build up the constitution of a person who is below par, one of the chief objects should be to tempt his appetite by appealing both to his eye and sense of taste. It will not matter how nutritive or necessary a food may be, the patient may refuse to take it unless he enjoys it—in commercial life the successful restaurant manager depends very largely upon attractive appearances to increase his sales, and make his business a success.

A competent dietitian is worth her entire salary for æsthetic reasons alone. Who can estimate in money what it means to have:—

(*a*) Hot foods served hot and on hot plates;
(*b*) Cold foods served cold and on chilled dishes;
(*c*) Gravies, soups, sauces, and in fact all foods properly seasoned and flavoured;
(*d*) Foods served in moderate quantities, attractively spaced on the plates instead of being "splashed on."

These items may not figure in the cost report, but make the difference between first-class and third-class meals.

III. SCIENTIFIC AND MEDICAL.

The scientific and medical reasons for installing a dietitian are the most important and best known. In diseases of metabolism such as diabetes and nephritis, the very life of a patient may depend upon a correct diet to suit the disease. Therefore, a dietitian must have a thorough knowledge of metabolism, food values, diet in disease and also methods of preparation used in invalid cooking. She must be familiar with the latest types of dietetic treatment for these diseases so that she can intelligently follow a doctor's diet prescription.

Almost all the patients in our hospitals and sanatoria are below par and it is essential to give special attention to the following points:—

(*a*) *Digestibility of Foods.*—Certain foods may be harmful or the opposite, depending upon the method of preparation. The dietitian issues instructions covering this point.

(*b*) *Correct balance between Protein and other Food Principles.*—It is essential to the health and speedy recovery of these patients that their regular diet should be well balanced as serious disorders may result from a badly balanced diet.

(*c*) *Estimation of Caloric Value.*—It is necessary to know the approximate number of calories served so that the dietitian may know whether the patient is receiving the correct quantity of food, either too much or too little may be harmful.

ATTRACTIVENESS AND VARIETY.

(*a*) This is of great value from the æsthetic standpoint but is so important that it can also be treated from the medical standpoint. Enjoyment and anticipation has a decidedly beneficial effect in stimulating the flow of the gastric juices and thus aiding digestion.

In January, 1917, Miss Laird, of the Household Science Department of the University of Toronto, compiled the dietary ration table now used by the Department of Soldiers' Civil Re-Establishment, with the assistance of several members of the staff, based in part on the results of experiments made at the University of Toronto dining hall. This table is of great assistance, enabling a dietitian to order approximately the quantities required, and also to furnish her cook with an accurate recipe.

In February, 1917, the first dietitian was installed in a military hospital, and from this time until March, 1918, dietitians have been installed in twenty-five hospitals. The Military Hospitals Commission had forty-five dietitians and pupil dietitians in the

various hospitals when the active treatment hospitals were transferred to the Department of Militia and Defence.

If a dietitian's work is to be effective she must be placed in full authority over the kitchen and dining-room help, and must receive the moral backing and support of the superintendent of the institution. Detailed returns are furnished by dietitians to the General Organizing Dietitian on the consumption of the various articles and service of meals, including total costs and cost per meal; also records of losses through wear and tear in equipment, silver, linen, and china. These returns are tabulated and are forwarded to the head office for comparative purposes. It is thus possible to check the quantities consumed in one institution by those consumed in others, and to see that the correct proportions of protein and other essentials to a well balanced diet are supplied. The costs necessarily vary according to the location of the hospitals and to whether the diets are general or special. In a tuberculosis sanatorium, where large quantities of milk, eggs and butter are consumed, the cost is higher per capita than in a convalescent hospital.

The economy achieved under a scientific dietary service may be illustrated by a reference to the fact that prior to the transfer of the principal hospitals of the Military Hospitals Commission to the Department of Militia and Defence, an increase or decrease of one cent per meal resulted in a variation in expenditure of $2,000 per week, or over $100,000 per annum.

There is a shortage of capable dietitians. There are enough graduates in household science, but not all possess natural ability as executives or are fitted for this type of work. To assist in training promising graduates, and so to save the department the experience of having to try out each applicant appointed to a position, the system of training pupil dietitians has been instituted. Graduates give their services for four months—really doing post graduate work—for their expenses, thus obtaining training but equally benefiting the hospitals.

The Dietary Branch of the department welcomes comparison with other hospitals in respect of cleanliness, quality of food, and superiority of service, and it is believed that such a comparison will demonstrate the absolute value of the scientific system it has organized.

AVERAGE COST OF MEALS PER PATIENT PER DAY IN HOSPITALS AND SANATORIA OPERATED BY THE DEPARTMENT.

	Cents.
General Treatment Hospitals—	
1917-1918	42
1918-1919	51·3
1919-1920 to December 31, 1919	60·7
Tuberculosis Sanatoria—	
1917-1918	70·5
1918-1919	69·3
1919-1920 to December 31, 1919	70·0

REPORT ON ACCOUNTING BRANCH.

This branch is under the control of a Supervisor of Expenditures who is responsible for all expenditures incurred by the department and the preparation of all statistics and statements relating to accounts.

No effort has been spared by the department to make this branch of the work as efficient as similar departments in large commercial industries. The latest improved methods for obtaining reliable figures have been adopted and an effective control over all expenditures is the continual aim of the executives. Owing to the rapid increase in the operations of the department, many changes in the routine have been necessary from time to time and such changes have always been towards greater efficiency and control of expenditures.

GENERAL ACCOUNTS.

Before any purchase may be made by head office or the unit offices, a purchase requisition is issued on the Purchasing Department by the storekeeper. This requisition is made out by the storekeeper, showing the "description of the material required," "purposes for which it is required," and the "department requiring same." Absolutely nothing is purchased direct from vendors by the heads of any departments, as the purchasing department is held responsible for all purchases. All requisitions are checked over to determine whether there is or is not any of the goods required on hand, or on order, so as to prevent over-buying.

Copies of the purchase orders for all goods ordered to be bought are sent to the storekeeper as a notification that such goods have been ordered, but does not show the quantity ordered, thus necessitating the actual count or weight of each lot of goods received.

Upon receipt of receiving slips from the storekeepers of the various stores to where the goods have been shipped, they are filed in a file and held until the copy of the invoice is received. Upon receipt of invoice, the invoice is checked against the receiving slip, also with the purchase order. The invoices are then listed on an invoice register and forwarded to Ottawa where they are carefully examined. No account is passed for payment unless it agrees with the quantities shown on the receiving slips and with the items as shown on the purchase orders.

These invoices are coded and marked as follows:—

1. With the Code Number representing Office or Institution chargeable.
2. With the Code Letter representing the month to which the account is to be charged.
3. With the Account Number designating the sub-accounts to be charged.

A distribution of all accounts payable is made on the invoice register under the following headings:—

1. Capital Expense (Buildings, Equipment, and Stores).
2. Administrative Expense.
3. General House Expense.
4. Kitchen and Dining-room Expense.
5. Medical Expense.
6. Vocational Expense.
7. Farm and Garden Expense.
8. Engineering Expense.
9. Information and Service.

Further sub-divisions are made of each of the foregoing accounts, varying from 25 to 150 classifications.

After the distribution of invoice registers has been checked at head office, cheques are issued in payment of each account and are mailed direct to the vendor.

All accounts bearing cash discount terms are paid seven days after the receipt at the head office. In this way the department is able to take advantage of all discounts for prompt payment, thus effecting a considerable saving to the country.

SALARIES AND PAY AND ALLOWANCES.

All salary and pay and allowance cheques are issued from the unit offices, these being the only cheques which are not issued in Ottawa. As soon as cheques have been issued, the pay-rolls are forwarded to the head office, together with the duplicate copies of cheques. Each duplicate copy is carefully examined and passed by the auditor.

An individual ledger account is kept at the head office for every member of the staff of the department; and for all men in receipt of vocational pay and allowances.

Copies of all orders affecting the pay of staff, or men undergoing vocational training are received at the head office and checked with the individual record. By this means unauthorized payments or discrepancies in pay are immediately deducted and duly adjusted.

A daily return of all cheques issued by the unit offices is made to the head office, Ottawa, which must agree with the total amount as reflected on the pay-rolls made up on that date. A special invoice register is prepared for salaries and pay and allowances. A distribution under the same headings, as those shown for general accounts, is made on this register.

COST ACCOUNTING.

A summary of accounts chargeable to each account number is made on the invoice register and from this summary Hollerith cards are punched, which constitute a record of all classified expenditures for each office and institution. At the end of each month these cards are run through the tabulating machine and balanced with the control ledger for the different expenses of the Unit under the main account headings already mentioned. When records are written by hand it is necessary to write the quantity and amount three times in order to distribute the information in three different ways, but when machine punch cards are used the distribution is obtained automatically by a simple sorting process.

The amount of information which it is possible to obtain by the use of machine punch cards is almost limitless. Nearly every question regarding an account can be ascertained by these cards.

The advantages of the machine punch cards are as follows:—

1. Possibility of securing greater detail in analysis than by hand.
2. Less time required in securing this analysis and preparing monthly statements.
3. Work proved each day and no delay at the end of the month in proving trial balance and subsidiary records.

All accounts are numbered, and a series of numbers has been provided for each department of an institution in order to show expenditures of requirements and replacements to keep equipment in its original efficiency for service, the sum of which represents operating costs.

GENERAL STORES.

All expendable supplies and materials are taken into and charged to stores, in the first instance, and no supplies or material can be withdrawn from stores except on authorized requisitions. As soon as withdrawals are made from stores, a journal voucher is issued crediting the stores account and charging the proper account to which such supplies are chargeable.

At given periods a physical inventory is taken of the material and supplies in the various stores throughout the country and the value of the goods in stores at the time the inventory is taken should agree in the aggregate with the amount charged to the stores account on the head office ledgers. All supplies and materials in stores at the time of taking the inventory should also agree in detail with the records which are kept by the Superintendent of Supplies and Equipment.

STAFF RECORDS.

A monthly return of the staff of the department is prepared by the Accounting Branch, which shows the following information:—

1. The number of employees in each unit.
2. Classification of duties performed.
3. The salaries chargeable to each branch.
4. The number of returned soldiers, civilians (male and female), employed in each unit.

A Hollerith card is punched for each member of the staff, thus enabling the Accounting Branch to prepare, at any time, a return, by units, or sub-units, showing the classification of duties, salary paid, number of returned men and civilians employed, and so forth.

ATTENDANCE RECORDS.

An account is kept for every member of the staff at head office, in which is recorded their attendance. This account shows who is absent from duty, the reason for such absence, time lost in the morning, at noon, or by leaving before authorized time at night, and the lost time recovered by working overtime. A daily report is made to the heads of branches of members of their staffs who have lost time during the day.

RELATIONSHIP OF HEAD OFFICE ACCOUNTING BRANCH TO AUDITOR GENERAL AND FINANCE DEPARTMENT.

The Head Office Accounting Branch is closely linked up with the Auditor General's Branch and the Finance Department. Daily returns are furnished to the Finance Department of all cheques issued, not only by the head office at Ottawa, but by each unit office. Letters of credit are issued by the Finance Department to the Department of Soldiers' Civil Re-Establishment on application by the Supervisor of Expenditures, who is responsible to the Finance Department for a correct return of disbursements made.

A monthly statement of cheques issued is furnished to the Auditor General and is supported by a certified voucher for each payment made, on which is shown the number of the cheque issued in payment. A copy of each paid voucher is filed in strict alphabetical order in the Record Branch of the Accounting Office.

PURCHASE LEDGER.

An account is opened for every firm or individual from whom purchases are made and to whom cheques are issued. This account is credited with the amount of the account rendered and debited with all cheques issued in payment thereof. The amount of business with any firm, and the total payment made to any individual is thus immediately available. A book-keeping machine has been installed for the purpose of keeping the purchase ledger accounts and owing to the rapidity and accuracy with which accounts can be posted, the book-keepers are enabled to balance their accounts daily.

DEPARTMENT OF SOLDIERS CIVIL RE-ESTABLISHMENT, STATEMENT OF DISBURSEMENTS FOR THE PERIOD OF FIFTY ONE (51) MONTHS, ENDING SEPTEMBER 30, 1919.

Capital Expenditures—		
General stores	2,615,120 13	
Buildings	6,208,955 73	
Equipment	2,390,702 33	
Live stock	3,765 60	
Total		11,218,543 79
General expenses—		
Administrative	4,114,952 41	
General house	2,226,427 75	
Kitchen and dining room	367,672 00	
Medical care of patients	5,800,556 31	
Vocational expenses	3,650,720 58	
Engineering	251,218 49	
Farm and Garden	70,390 58	
Information and service	350,892 63	
Total		16,832,830 75
Pay and allowances—		
Medical treatment	3,948,981 92	
Vocational	7,288,399 08	
Total		11,237,381 00
General advances—		
Cash	314,675 08	
Deferred charges to expenses	22,710 86	
Total		337,385 94
Accounts receivable		9,696 63
War bonus		60,297 18
Total disbursements		39,696,135 29

REPORT ON PURCHASING BRANCH.

The Purchasing Branch of the department at Ottawa and the sub-branches in each unit are under the control of the Chief Purchasing Agent, whose duty it is to purchase, for all branches of the department, all supplies and equipment required, to secure invoices covering such purchases and pass them to the accountant for payment.

Purchases are made only on requisitions, which must be properly approved by either the head of the department for which the goods are required or by the assistant directors of the units.

Tenders are called for from manufacturers and wholesalers and are submitted by them in sealed envelopes, showing only on the outside the number of quotation request and the date it is due to be opened. Such envelopes remain sealed until noon of the day shown thereon, when they are opened, tenders stamped and initialled, and prices scheduled in the office of the purchasing agent, in the presence of a representative of the War Purchasing Commission.

The methods and routine followed are those approved by the War Purchasing Commission, with whom the chief purchasing agent is continually in close touch.

Purchases in sub-branches are handled by a purchasing clerk, under the supervision of the assistant director in charge of the unit, who is authorized to place orders locally, only up to the value of $50. Copies of all such orders are mailed, as issued, to the Chief Purchasing Agent, Ottawa, for audit. When requisitions are received in the units for material, the value of which is more than $50, but under $500, tenders are first obtained by the purchasing clerk from local manufacturers and merchants and the requisition is then forwarded with all such tenders to the Chief Purchasing Agent, who either approves the requisition for local purchase or proceeds to obtain

additional tenders, as the circumstances may warrant. Requisitions received in the unit offices for supplies, the value of which exceed $500, are forwarded direct to the Chief Purchasing Agent, Ottawa, for action in accordance with the requirements of the War Purchasing Commission.

By this system, not only can quick and efficient service be given to all branches of the department but all purchases exceeding the sum of $50 are specially dealt with under the personal supervision of the Chief Purchasing Agent. The Chief Purchasing Agent is kept continually informed of all purchases made for the department throughout the Dominion for smaller sums than this. This control not only ensures purchases being made to the greatest advantage, but enables the Chief Purchasing Agent to secure a uniformity of supplies at all points, which would not otherwise be possible. Furthermore, it has made possible the standardizing the greater part of equipment, which in this way can be purchased for many points at the same time and, consequently, in large quantities, resulting in the procuring of it at the lowest possible cost.

The accounting and checking systems employed are such that the saving effected by taking advantage of cash discount offered pays a large proportion of the cost of maintaining the Purchasing Branch at head office. The cash discounts referred to are in addition to the trade discounts which the department secures.

REPORT ON SUPPLIES AND EQUIPMENT BRANCH.

This branch is charged with the provision of and the proper keeping of the records pertaining to all furnishings and equipment of the various institutions and offices of the department throughout the Dominion, with the exception of the technical equipment provided for vocational training, which is under the charge of the Vocational Branch.

(1) *Equipment for new Hospitals and Sanatoria.*—When the department is opening a new institution, blueprints of the premises are furnished by the Engineering Branch, which plans show the buildings room by room and also the purpose for which each room will be used. From these blueprints lists are prepared giving the furniture and equipment allotted to each room, as laid down in the "Standard Table of Equipment" adopted by the department. A summary of these lists is then compiled, and requisition for the purchase of the equipment passed to the Chief Purchasing Agent. Orders for the equipment are placed sufficiently long ahead to allow for the delivery of the goods and their being placed in the buildings in time for the opening of the institution on the date specified.

(2) *Equipment for Institutions already in operation.*—Stores are maintained in all institutions. When replenishment or new equipment is required, the storekeeper prepares a covering requisition and submits it to the Medical Superintendent in charge, or his representative, who, if he approves, affixes his signature and passes the requisition to the Assistant Director of the Unit for his approval. If the requisition is approved by the Assistant Director, he forwards it to the head office, Ottawa, for the necessary action in accordance with the requirements of the War Purchasing Commission, unless the goods are emergently needed. (See report on Purchasing Branch.)

When the requisition is received at the head office, it is immediately entered in the requisition register or uture reference. Before taking any action, the quantities of the articles requisitioned for are checked against the quantities shown as on hand on the equipment ledger of the institution. If it is considered that the goods are actually required, a covering requisition is made out and passed to the Chief Purchasing Agent, together with a copy of the original requisition for purchase.

When the order for the goods has been placed by the Purchasing Branch, a copy of the requisition is returned to the Supplies and Equipment Branch, giving purchase order number as well as the name of the firm with whom the order has been placed. This copy of the requisition is then returned to the Assistant Director of the Unit for his information in order to enable him to communicate direct with the Contractor if the goods are not delivered within a reasonable time. If, however, the quantities of the articles requisitioned for are considered excessive, or if the goods specified are not allowed on the Standard Table of Equipment, the requisition is returned to the Assistant Director with a covering letter.

(3) *Receiving of Equipment at Institutions.*—On receipt of goods at an institution, they are carefully checked by the storekeeper as to quantities and condition, and receiving slips made out covering each order. (It may be stated in this connection that the copies of the orders sent to the storekeepers do not show the quantities of the various articles ordered, thus necessitating an actual count of the goods.) These receiving slips are then checked with the purchase orders and invoices by the Accounting Branch of the unit in which the institution is located, before the invoices are certified for payment.

(4) *Equipment Ledger.*—In order to maintain a correct record of all equipment, whether the property of or on loan to the department, equipment ledgers are kept for all institutions and offices under the department. In the case of goods purchased, the entries show the dates of purchase, names of contractors, invoice numbers and prices of articles, which information is taken from the respective invoices. When articles are "on loan," they are entered on the ledgers with a notation to that effect. If articles of equipment have been donated, they are shown on the ledgers as "donations." Equipment ledgers for the institutions and offices in each unit are also kept at the unit Head offices for the purpose of verifying the accuracy of the ledgers, physical inventories are taken half-yearly and checked with the records.

(5) *Condemnation Boards.*—When articles of equipment have been broken or become of no further use through fair wear and tear, they are taken back into stores and held for inspection by the Condemnation Board. This Board, consisting of the Assistant Director of the Unit, his representative at the institution, and the Medical Superintendent of the sanatorium or hospital, meets at each insitution quarterly, or more often, if required, for the purpose of examining such articles as may be brought before them owing to their being of no further use, as well as to investigate losses. The findings of the board are forwarded to head office for the approval of the Deputy Minister, and, if approved by him, are the authority for having such articles written off charge on the equipment ledgers.

(6) *Central Stores.*—In order to facilitate the purchase of equipment to the best advantage, orders are placed for large quantities, and such equipment and supplies are stored in the three central stores operated by the department in Montreal, Guelph, and Regina. This enables the department to supply urgent needs with the least possible delay.

(7) *Technical Equipment, Vocational Branch.*—Complete ledgers are kept by the Vocational Branch of the equipment in each institution and the supplies sent to it, as well as of the disposition of these supplies. From these statistics is obtained the distribution of costs.

These equipment ledgers are accessible at any time, and show the amount of equipment in any class-room in any school which is directly under the department. The vocational equipment is purchased through the general purchasing system on requisitions approved by district vocational officers.

The equipment ledgers are of greater value than merely to contain a statement of the amount of equipment on hand at the various schools. They are constantly referred

to when additional equipment is required, in order that there may not be duplication of machinery for any school, also that the machinery supplied will be such that the experience gained will be diversified.

When course outlines are submitted to Ottawa, the equipment ledgers are scanned very closely in order to ascertain whether or not the school possesses the equipment for satisfactorily giving the course suggested. If the equipment is found to be inadequate a suggestion is made that it be brought up-to-date by the purchase of second-hand or new machinery, so that every moment of the ex-soldier's time during his re-training course will be profitably spent. That is, the greater stress is placed on practical demonstration and operation.

The equipment ledgers also give a definitive, reliable record of all tools and machinery loaned by the various manufacturers of machinery for certain purposes, such as demonstration of tractors, sulky ploughs, disc harrows, gas engines, magnetos, carburettors, delco lighting systems, battery sections, demonstration boards of various kinds; in fact, a great variety of machinery which is of extreme importance to a school, but need not be purchased since manufacturers make it a point of their advertising to supply schools with demonstration material, providing it is returned, after a certain definite period, in good condition.

APPENDIX I.

Negotiations with the Imperial Authorities and others—Report of the Assistant Deputy Minister's visit to England.

FOREWORD.

For the past year or more the Department of Soldiers' Civil Re-Establishment has carried on negotiations with the British Government regarding the treatment and training of ex-members of the Imperial Forces resident in Canada, and in the spring of 1919 it was decided that the Assistant Deputy Minister of the department should proceed to England in order to bring these negotiations to a conclusion.

The following report by the Assistant Deputy Minister, with the attached schedules, sets forth the views of the department also the arrangements discussed in respect of the augmentation of pensions, provision of treatment and training, with allowances at Canadian rates, to ex-members of Imperial Forces in Canada and the United States of America and the provision of treatment and training, with allowances at British rates, to ex-members of Canadian Forces in the United Kingdom.

Attached is also a copy of Order in Council (P.C. 2025) dated 30th September, 1919, by which the Government of Canada registers its approval of these arrangements.

OTTAWA, September 5, 1919.

SIR,—In accordance with the instructions contained in the letter from the Deputy Minister to myself, dated the 27th May last, I proceeded to England.

2. While in that country, I carried out negotiations with the Ministries of Pensions and Labour, and subject to your approval and confirmation by His Excellency the Governor General in Council, entered into certain tentative arrangements. These arrangements cover the following matters:—

(*a*) Augmentation of pensions of disabled ex-members of the Imperial Forces, and their widows, when resident in Canada or the United States of America, at the expense of the Imperial Government.

(*b*) Treatment and training, and payment of treatment and training allowances to ex-members of Imperial Forces, when in Canada or the United States of America, at Canadian rates, at the expense of the Imperial Government.

(*c*) Provision of treatment and training to ex-members of Canadian Forces, resident in the United Kingdom, with allowances at British rates at the expense of the Canadian Government.

(*d*) Provision, renewal and repair of artificial limbs and appliances; the British Government to deal with ex-members of the Canadian Forces in the United Kingdom at the expense of the Canadian Government; and the Canadian Government to deal with ex-members of the Imperial Forces in Canada and the United States at the expense of the Imperial Government. Dental treatment in the United Kingdom comes under this Branch.

(*e*) Transfer to British hospitals, under the authority of the Ministry of Pensions, of members of the Canadian Expeditionary Force who are being discharged in England and who require further continuous treatment.

3. Authority by the Ministries of Pensions and Labour, in their respective spheres, to augment pensions of pensioners in Canada and the United States of

America to Canadian rates, and to pay treatment and training allowances at Canadian rates, is contained in the following decision of the War Cabinet, dated 16th July, 1919. Authority for the other matters referred to did not require Cabinet action:—

"(*a*) Pre-war British residents in Canada and the United States who enlisted in the Imperial Forces or Reservists who rejoined from these countries should be allowed the option of taking pensions and allowances and medical treatment and training, and all other privileges, at the same rates and on the same terms as are provided by Canadian Orders in Council, in place of the rates of pensions, etc., accorded under Royal Warrants.

"(*b*) The Canadian Pensions Administration (the Department of Soldiers' Civil Re-Establishment) be asked to undertake the investigation of claims to pension and the medical examination of disabled men in accordance with the principle and practices of Canadian Orders in Council relating to pensions, and to award pension on behalf of the British Government, subject to confirmation by the Ministry of Pensions in each case. Provision for the necessary safeguards as to identification of beneficiaries required by the Appropriation Act; for the preservation of the responsibility of the Minister to Parliament; for the rendering of accounts by the Canadian authorities; and other details of the arrangement to be agreed with the Treasury.

"(*c*) Similar arrangements should be sanctioned with other self-governing Dominions."

4. Tentative arrangements have been made with the British Office of the Board of Pension Commissioners to deal with pay and allowances; to pass upon the eligibility of ex-members of the Canadian Forces for re-treatment or re-training and to pay the necessary accounts on behalf of this department.

5. At the instance of Captain Baker, M.C., arrangements were made with the Overseas Military Forces of Canada for a change in the procedure respecting the discharge of blinded Canadians and their subsequent transfer to Canada.

6. Through conferences and correspondence, negotiations have been commenced and are likely to be concluded in the near future, providing for reciprocal arrangements with the Governments of Australia, New Zealand and France for the treatment and training and pay and allowances of ex-members of the forces of these countries resident in Canada, and of ex-members of Canadian forces resident in these countries.

7. Investigations were made into a number of other subjects including the operation of the Corps of Commissionaires and the Veterans' Corps.

8. The foregoing negotiations entailed many conferences with ministers, officers of departments interested, representatives of other governments; officials of the Overseas Military Forces of Canada; the Board of Pension Commissioners and many others.

9. In all quarters, particularly by the heads of branches in the Ministries of Pensions and Labour, I was received with the utmost courtesy and the problems which it was my duty to submit were given the consideration which their importance warranted. Especially I should note the unfailing courtesy and kindness of the Right Hon. Sir Laming Worthington Evans, Bart., the Minister of Pensions, who not only dealt personally with the proposals submitted, but directed his officers to devote such time as was necessary to the working out of the details. From Mrs. Ethel Wood, O.B.E., Secretary of the London War Pensions Committee, I received a great deal of assistance. Mrs. Wood evinced the warmest interest in the furtherance of my proposals.

10. I desire also to acknowledge the assistance and advice which I received from Mr. W. E. Segsworth and Mr. T. A. Stevenson, who were visiting England in connection with an investigation into vocational training and employment conditions in that country on behalf of the department, Major W. H. Kippen, D.S.O., M.C., and

the staff of the London office, Captain Featherstonhaugh and Captain Shields of the Board of Pension Commissioners, and Mr. W. Stockdale, the Officer Paying Imperial Pensions in Canada.

11. The various matters dealt with herein each form the subject of a separate report, which I have attached hereto. The memoranda, which form part of these reports, had not, at the time I left England, been passed upon by the Treasury, though they had been approved by the Treasury representatives at the Ministries of Pensions and Labour but it is not expected that any changes will be made by the Treasury in view of the War Cabinet decision. Should any changes be made they will affect only details of administration as the principles have been settled.

12. When the arrangements outlined have been approved by the Privy Council, I have been asked by the Ministry of Pensions unofficially to visit Newfoundland and to negotiate a similar agreement. Imperial pensioners in Newfoundland are paid by the officer paying Imperial pensions, Ottawa, so that they will receive pensions at Canadian rates.

I have the honour to be, sir,
Your obedient servant,

E. H. SCAMMELL,
Assistant Deputy Minister.

The Hon. Sir James A. Lougheed, K.C.M.G.,
Minister of Soldiers' Civil Re-Establishment,
Ottawa.

SUMMARY.

Schedule "A."—Letter, embodying proposals submitted to the Right Honourable the Minister of Pensions, by Mr. E. H. Scammell, Assistant Deputy Minister of Soldiers' Civil Re-Establishment and Mr. W. E. Segsworth.

Schedule "B."—Report on augmentation of pensions of ex-Imperial soldiers in Canada and the United States—Payment of Treatment and Training allowances—Provision of Artificial Limbs, etc.

Schedule "C."—Report on treatment of ex-Imperial soldiers in Canada and the United States of America and payment of treatment allowances at Canadian rates.

Schedule "D."—Report on provision of treatment to ex-members of Canadian Forces resident in the United Kingdom with allowances at British rates at the expense of the Canadian Government.

Schedule "E."—Report on provision, renewal and repair of artificial limbs and appliances to ex-members of the Canadian Forces in England, also the provision of dental treatment.

Schedule "F."—Report on provision of training and payment of training allowances to ex-members of the Canadian Forces resident in the United Kingdom and of ex-Imperial Forces resident in Canada.

Schedule "G."—Report on transfer to British hospitals of members of the Canadian Expeditionary Force for further continuous treatment.

Schedule "H."—Report on proceedings respecting discharge of Blinded Canadians in England, and their subsequent transfer to Canada.

Schedule "I."—Report on proposed reciprocal arrangements with the Governments of Australia, New Zealand and France.

Schedule "J."—Report on Corps of Commissionaires and Veterans' Corps.

SCHEDULE A.

Copy of letter, addressed to the Right Honourable the Minister of Pensions, embodying the proposals submitted by the undersigned and Mr. W. E. Segsworth at a conference with the Minister on the 13th June, 1919, dated the 18th June.

Agreeably with your request we have the honour to submit the following statement regarding the question of reciprocal arrangements between the British and Canadian Governments relative to the treatment, training, and payment of pensions of ex-members of the Imperial Forces resident in Canada, and the United States of America, and the treatment and training of ex-members of the Canadian Forces resident in the United Kingdom.

The question divides itself as follows:—

(A) Ex-members of Imperial Forces resident in Canada.
(B) Ex-members of Canadian Forces resident in the United Kingdom.
(C) Ex-members of Imperial Forces resident in the United States of America.

(A) Ex-Members of Imperial Forces Resident in Canada.

At the outbreak of war there were a number of British reservists resident in Canada, and during the progress of war, various Imperial units were raised, such as the Royal Air Force, branches of the Imperial Navy, Inland Water Transport, etc. On the return of these men to Canada, incapacitated for further service, they are awarded pensions on the British scale, and in the event of their death on, or as a result of, service, their dependents are awarded pensions on the British scale.

There are five aspects of the situation:—

(1) Men suffering a recurrence of disability caused by service, necessitating further medical or hospital treatment.
(2) Men who are entitled to, and require, retraining.
(3) Dependents of men who have died on, or as a result of service.
(4) Provision of Artificial Limbs and Orthopædic appliances.
(5) Pensioners generally.

The size of the problem may be judged by the following approximate figures regarding Imperial enlistments from Canada:—

British Reservists	3,500
Royal Air Force	20,000
Imperial Motor Transport (A.S.C.)	1,500
Inland Water Transport (R.E.)	8,000
Naval Service	2,800
Transfers from Canadian to Imperial Forces in England, say	12,000
Re-enlisted Pensioners	500
Men who left Canada at their own expense and enlisted in the Imperial Forces principally owing to the lack of consent of their wives in Canada, say	2,000
Total	50,300

(A.1). Men suffering a recurrence of disability caused by service necessitating further medical or hospital treatment.

This class can be subdivided as follows:—
(*a*) Men who require hospital treatment.
(*b*) Men unable to work, but requiring occasional treatment.
(*c*) Men able to work and requiring occasional treatment.
(*d*) Insane.

Class (a) includes men suffering from tuberculosis requiring sanatorium treatment. The Government of Canada has established, or is using, twenty-seven sanatoria, stretching across the continent, in which men are treated until their cases become arrested. When discharged from the sanatorium 100 per cent pension is granted for six months, at the conclusion of which the man is re-examined.

In this class also are men who develop a disability due to service, and who require treatment, or surgical operation, in a general hospital, or a hospital operated by the Department of Soldiers' Civil Re-Establishment.

Class (b). It sometimes occurs that a man can do better at his own home than in hospital. In this case he is visited periodically by a Medical Officer of the Department, and is granted a further eighty cents per day for subsistence allowance. He is known as a "Class 1 Out-Patient."

Classes (*a*) and (*b*) are granted pay and allowances for themselves and dependents equal to what they received while on active service.

Class (c). It is often found that a man can undertake light work, or even follow his original occupation, but that he requires periodical treatment for a wound which has not completely

healed, or which has broken out again, or for some other disability. The Department has established night clinics in the principal centres, and has made arrangements with local medical men in other centres, for the free treatment of such men. They are known as "Class 2 Outpatients". They receive no pay and allowances, but reasonable expenses for attending the clinics, may, if necessary, be paid to them.

Class (d). The Department is charged with the entire responsibility for insane ex-members of the forces, and cares for them either in hospitals for the insane operated by the Department, or in Provincial Institutions. The maintenance paid in the latter case is the net cost to the province. These men are not pensioned, but if their insanity has been caused or aggravated by service their dependents are granted allowances equal to the amount they would have received had the men been killed.

(A.2) Men who are Entitled to and Require Re-training.

All men who have suffered a disability which prevents their return to their pre-war occupation are entitled to re-training for a new occupation. The Department is at present training men in 400 different occupations. This branch of the work is very fully organized. Before any man is accepted for re-training he is interviewed by an expert, is submitted to a medical examination, is brought before a Disabled Soldiers' Training Board, is seen by an employer carrying on the line of occupation he wishes to learn, and the statements made are carefully checked with his medical record. Care is taken to train the man in an occupation in which he will not only now, but hereafter, be able to find employment. Carefully compiled statistics show that 95 per cent of the men taking training are successfully placed, and that the average wage earned by these men is 15 per cent greater than their pre-war wage, without regard to any pension they may be receiving for their disability.

Authority has recently been granted to the Department to train boys who enlisted under the age of 18, and desire to learn some trade or profession. This limit may be raised to 19 or 20 years of age.

(A.3) Dependents of Men who have Died on, or as a result of Active Service

The position of the British widow in Canada is an unfortunate one. The widow's pension is such that it is absolutely necessary for her to augment it by going out to work, however large or young her family may be. On the other hand the widow of the Canadian soldier, living perhaps next door, is able to carry on on the Canadian pension.

With reference to the three classes above referred to, A1, A2, and A3, the rate of allowances payable by the Canadian Government has been fixed after most careful investigation by experts on the cost of living in Canada, and may be regarded as the minimum on which it is possible for the men or their families to live.

The rate of allowances payable by the British Government has doubtless been based upon conditions in the United Kingdom, but it has been found to be inadequate for men and their dependents living in Canada. The result is that it has been necessary in a large number of cases for local charity to interest itself, and to augment the allowance referred to. This disparity naturally causes a considerable amount of criticism among the men themselves, and the public generally. It is found in many cases to be impossible for a man with a family to undergo treatment for a disability incurred on service as it is necessary for him to provide for the maintenance of his family. This naturally results in increased disability with consequent increase in pensionability. Further, men who would benefit by retraining are often unable to undertake it for a similar reason.

(A.4) Provision of Artificial Limbs and Orthopædic Appliances.

The Department has established a central factory with fitting depots in all parts of Canada for the provision, renewal and maintenance of artificial limbs. It was considered necessary to standardize these limbs in order that repairs and renewals might be carried out as effectively and expeditiously as possible, and in order that those who had suffered amputation might be able to obtain, at the expense of the Government, the best artificial appliances it was possible to furnish, and to prevent the men from being exploited by unscrupulous manufacturers. The Government of Canada is prepared to provide these appliances for ex-members of the Imperial forces, and to maintain and renew them if so desired, at actual cost.

When an ex-member of the forces is required to attend hospital or fitting depot he is entitled, under Canadian Regulations, to certain expenses and allowances to cover his out-of-pocket expenses and loss of time.

(A.5) Pensioners Generally.

You were good enough to suggest that the pensions of ex-members of the Imperial Forces, now, or hereafter, residing in Canada, should be based on the Canadian rates. This is a matter which has occasioned a large amount of discussion in Canada, and public opinion is unanimous on this point. This public opinion expressed by such organizations as Boards of Trade (Chambers of Commerce), Labour Councils, Manufacturers' Associations, Patriotic Societies, and many organized bodies of the veterans themselves, is based on the following grounds. It was impossible for many of these men to enlist in the Canadian Forces, e.g., there was no Canadian Air Force in which they could enlist; the Mechanical Transport men were secured by the Government of Canada at the request of the Imperial Government; the Inland Water Transport were specially enlisted by the Imperial Government; many married Canadians who were anxious to proceed at once to the front enlisted in the Imperial Forces as they could not secure the consent of their wives, which was at that time a necessary condition for enlistment in the Canadian Expeditionary Force; a large number of Canadians transferred to the Imperial Forces in order

to take commissioned rank at the urgent request of the Imperial Government, and by so doing, suffered a pecuniary loss during the whole of their service, inasmuch as they forfeited separation allowance for their wives and families from the day they accepted an Imperial Commission. There is a strong public sentiment that these men should not be penalized on account of their answering the urgent call of the Imperial authorities.

Ex-members of Canadian Forces Resident in the United Kingdom.

A number of ex-members of the Canadian Expeditionary Force have taken their discharge in England and have settled in this country, while others who returned to Canada have again crossed the Atlantic. These men will require, in many instances, hospital treatment, vocational training, supply of artificial appliances, etc. The Department of Soldiers' Civil Re-Establishment is desirous of entering into arrangements with the Ministry of Pensions whereby the facilities of the Ministry or those of such other Departments of the Imperial Government as may be interested in the treatment and training of disabled soldiers in the United Kingdom may be placed at the disposal of the Government of Canada. The Department of Soldiers' Civil Re-establishment has established an office in London, and, in conjunction with the London office of the Board of Pensions Commissioners, this office would act as a clearing house in this connection. Where the British rates for men undergoing treatment or training are higher than the Canadian, arrangements could be made for the payment of these higher rates, but where the British rates are lower, if it is considered by the Ministry of Pensions that the lower rates should apply to Canadians, arrangements to this effect will be made It is submitted that whatever detailed arrangement is entered into in this connection it would greatly simplify matters both for the British Government and the Canadian Government if an arbitrary rate were determined upon for the cost of training and for the cost of treatment, subject to review from time to time.

(C) Ex-Members of Imperial Forces resident in the United States of America.

Arrangements are being made between the Department of Soldiers' Civil Re-Establishment and the War Risk Insurance Bureau of the United States for the treatment of ex-members of the Canadian Forces resident in the United States, when such men develop a post-discharge disability due to or attributable to war service.

A number of applications have been made to the Department regarding ex-Imperial Soldiers in the United States. It cannot be expected that the United States Government will undertake the care and treatment of these men at its own expense. The Enlistment in the Imperial Forces from the United States, through the British War Mission, was 13,853, spread over 92 centres, It is not possible to estimate the number of men who travelled to the United Kingdom to enlist, and who will return to the United Staes.

In order that no ex-members of the Imperial Forces resident in the United States may become subjects of public charity the Department of Soldiers' Civil Re-Establishment has, in several instances, assumed responsibility for the cost of their treatment. The Department is willing, if so desired by the Ministry of Pensions, to undertake to deal with all ex-members of the Imperial Forces in the United States in exactly the same way as it is doing with its own men, and to render an account monthly to the Ministry of Pensions. It is submitted that this will result in very much quicker action, and will save the Imperial Government the necessity of the establishment of offices for this purpose in the United States, with a consequent large saving of expenditure. The Department has not arranged for the retraining of ex-members of the Canadian Forces in the United States, as training facilities in that country do not compare with those in Canada, but it has arranged to pay the railway transportation from the International Boundary of men who are eligible, and who desire, to take retraining in Canada, and to pay allowances for the period of retraining. This arrangement can be carried out in the case of ex-members of the Imperial Forces resident in the United States. The agreement with the Government of the United States is reciprocal, ex-members of the American Forces resident in Canada being entitled to privileges enjoyed by ex-members of the Canadian Forces, at the expense of the United States Government.

General.

As matters now stand they cannot be satisfactory to either the British Government or the Government of Canada. Ex-members of Canadian and Imperial Forces are undergoing treatment in the same hospitals, side by side, or are receiving training in the same workshops, in many cases they have similar family responsibilities, they are members of the same Veterans' Associations, but the allowances they receive or the pensions for the same disabilities incurred in a common cause, are widely divergent. This subject is a common topic of discussion among the men and many ex-members of Imperial Forces consider that they have a distinct grievance. In Canada if the requirements of the ex-members of the Imperial Forces are not met by the British Government, charitable aid will have to be extended to these men, or the Government of Canada will be obliged to augment the British allowances, a course which it is thought would be most distasteful to the Imperial authorities.

In submitting the foregoing proposals we are acting under the authority of the Honourable the Minister of Soldiers' Civil Re-Establishment, who has directed us to assure the British Government that the Government of Canada desires to place its facilities fully at your disposal. The proposed reciprocal arrangement, will, it is suggested, meet the difficult situation in a way which will be satisfactory to both Governments, and to the men and their families who are interested. So far as the Department is concerned it is not proposed to charge the British Government any overhead expenses, or to include any capital charges, depreciation, etc., and it is presumed that similar terms can be arranged with your Department.

It will be apparent that by utilizing Canadian administrative machinery in Canada, and British machinery in the United Kingdom, overlapping will be avoided, and many cases of dissatisfaction, due to inequalities of treatment, removed. This must follow as both the British and Canadian systems and rates are the result of mature consideration of local conditions.

If the principle of the arrangement herein outlined is accepted by the British Government it will be referred by us for confirmation by the Governor General in Council, after which the details can be concluded with the officers of your Department and of any other Departments interested.

It would appear to be highly desirable in the interests of efficiency and economy that all payments for pensions and other non-effective services outlined herein may be made through one office in Canada.

Enclosed is a copy of the Order in Council (P.C. 387, 1919) under which the Department of Soldiers' Civil Re-Establishment operates, in so far as pay and allowances are concerned.

Respectfully submitted,

E. H. SCAMMELL.

SCHEDULE B.

Augmentation of pensions of Ex-Imperial soldiers in Canada and the United States—Payment of Treatment and Training Allowances—Provision of Artificial Limbs, etc.

Shortly after the receipt by the Minister of Pensions of the letter of June 18, (Schedule "A"), conferences with the Officials of the Ministry of Pensions were arranged. It was found that the augmentation of pension to Canadian rates of those Imperial pensioners who might hereafter proceed to Canada or the United States would not be entertained.

2. After the decision of the War Cabinet had been reached, the following memorandum was prepared:—

PROPOSED ARRANGEMENTS FOR DEALING WITH IMPERIAL PENSIONERS, ETC., IN CANADA AND UNITED STATES OF AMERICA.

A. MEN RESIDENT IN CANADA.

1. *Introductory.*

(1) It is proposed to make use of the Canadian Pension Administration with power as the agent of the British Ministry of Pensions to provide for Imperial Pensioners and claimants to pensions resident in Canada at the outbreak of war, and who have since returned to Canada the same pensions and allowances and other advantages at the same rates and by the same machinery as they are administered on behalf of Canadians chargeable to the Canadian Government. The arrangements will apply to disabled seamen and warrant officers (other than Commissioned Naval Warrant Officers), non-commissioned officers and men of the Marines, Army and Air Force, and the widows, children and dependents of those deceased. The arrangements will not extend to disabled officers and nurses, or the families and relatives of deceased officers and nurses, except as regards the treatment of disabled officers and nurses (see B. below).

Pensions will be dealt with by the Board of Pension Commissioners for Canada, and all matters affecting the Canadian Pension Administration herein will be subject to their control. Treatment, training and other matters administered in behalf of ex-members of the Forces in Canada by the Department of Soldiers' Civil Re-Establishment will be dealt with by that Department.

The new arrangements will, if possible, take effect from September 1st next.

The officer paying Imperial Pensions, Ottawa, shall furnish to the Ministry of Pensions a nominal roll of men drawing pension for whom he has no medical history and the Ministry of Pensions shall forward, in respect of each such man, a precis of his medical history and a copy of his last Medical Board. A separate list of officers will be furnished and similar information supplied.

(2) Men already drawing Conditional Pensions.

These men would be traced through the Officer Paying Imperial Pensions at Ottawa. Steps are to be taken to have these men medically re-examined by Canadian Medical Boards as soon after the 1st September next as possible (spread over the following three months) and on the occasion of the re-examination the men will be given the opportunity of deciding whether they will accept pension, and allowances and medical treatment and training and all other privileges at the same rates and on the same terms as are provided by Canadian Regulations in place of the rates, etc., accorded under the Imperial Royal Warrant. This option will be offered and accepted or rejected once for all and shall not be subject to alteration as long as the pensioner is resident in Canada or the United States of America. A signed declaration will be obtained from the pensioner to the effect that the binding nature of the exercise of this option is thoroughly appreciated. On leaving Canada or the United States of America the pensioner will revert to British rates.

The Medical Board will re-assess the pension upon the Canadian or British scale in accordance with the acceptance or rejection by the pensioner of the option, and record among other details full particulars of the disability, the percentage of disablement assessed, and the amount of pension and children's allowances awarded. The record will be prepared in duplicate, one copy being sent to the Ministry of Pensions, Chelsea Hospital, for the purpose of examining the award, the other copy being retained by the Canadian Pension authorities with the duplicates of the other papers relating to the pensioner. (See para. 15 below.)

On receipt of the papers at Chelsea Hospital they will be examined there and the award confirmed or referred back to Canada for reconsideration in the case of a disagreement. Provisional payment of the award at the revised rates including arrears from 1st September next will be made directly the findings of the Canadian Medical Board are made known.

(3) Men already permanently pensioned.

These men would also be traced through the officer Paying Imperial Pensions at Ottawa, and notified that if they wished to obtain the benefit of the new scheme they must present themselves for re-boarding, when they would be given the option of taking the Canadian rates of pension or remaining under the British Royal Warrant. The same arrangements for confirmation and payment of the award will be made as under (2).

(4) Cases under Article (9) of the British Royal Warrant where the disability has emerged since discharge and no award has yet been made.

Application will be made by these men to the local representative of the Board of Pension Commissioners who will make arrangements for boarding them and assessing their pensions, if it is decided that the disability was attributable to or aggravated by war service. The records will be prepared in duplicate, one copy being sent to the Ministry of Pensions, Chelsea Hospital, the other being retained in Canada. Chelsea Hospital on receiving the record will decide whether the award can be confirmed, varied or rejected, and notify the Canadian authorities accordingly. If the award is confirmed a duplicate of the man's medical history, etc., at Chelsea Hospital will accompany the notification to Canada.

Pending confirmation or otherwise of the award by Chelsea Hospital the Canadian authorities will make temporary advances to the man which will be deducted if the award is confirmed from the arrears of pension, etc., awarded during the time the temporary advances were in force. Before any advance is made to the man it will be necessary for him to furnish reasonable evidence that he has served with the Imperial Forces during the present war.

(5) Widows and Dependents already pensioned.

The Officer Paying Imperial Pensions will prepare a list of these cases, and they would be revised forthwith. These pensions will be permanent except in the case of a widow whose husband died of a disability not due to or aggravated by service, when the pension ceases at the expiration of one year from the termination of the war; and except in the case of a widow who re-marries, when the pension ceases forthwith, but not the children's allowances, the widow receiving a gratuity equal to one year's pension. In certain cases dependents in receipt of pensions under the Imperial Royal Warrant will not be entitled to pensions under the Canadian Regulations or will be entitled to smaller pensions. The Canadian authorities have agreed to have the benefits under both Imperial and Canadian conditions carefully explained to these beneficiaries before they exercise their option, in order to safeguard their interests.

(6) Imperial Pensioners (disabled men, widows and dependents) not yet returned to Canada.

The Officer Paying Imperial Pensions at Ottawa will arrange for the revision of these pensions as the cases are passed on to him, and the arrangements under (2), (3), and (5) will apply accordingly.

(7) Widows and dependents of disabled men who die after their return to Canada.

Application will be made by these widows and dependents to the Canadian authorities who will at once cable to the Ministry of Pensions notifying the death of the man and request copies of his records to be sent out to Canada forthwith. On receipt of the documents the Canadian authorities will investigate the claim, and if in order will make a provisional award. The results of the investigation will be prepared in duplicate, one copy being sent to the Ministry of Pensions, Widows and Dependents' Section, the other copy being retained in Canada. The Widows and Dependents' Section of the Ministry will on receipt of the papers confirm, revise, or reject the award, and inform the Canadian authorities accordingly. Pending the receipt of the confirmation or otherwise of the provisional award the Canadian authorities will make advances to the beneficiaries as in the case of the men under paragraph (4) above.

(8) Gratuities.

In view of the difficulties attending the recoveries of lump sum payments, the Canadian authorities will make temporary advances only to disabled men or widows who re-marry, to whom they award gratuities pending the confirmation of the award by the British Ministry of Pensions. Such advances should take the form of weekly allowances not exceeding 1/26th of the estimated amount of the gratuity.

(9) Alternative Pensions.

Where a disabled man, or widow of a deceased man, of the Imperial Forces elects to continue his rights under the British Royal Warrant and claims an alternative pension, his

claim will be investigated by the Canadian Pensions Board, and duplicates of the papers will be sent to the Alternative Pensions Section, Ministry of Pensions, for award. As in this country, there will be no payment of recoverable advances in the meantime. It is anticipated that these claims will be very few having regard to the high remuneration obtaining in Canada as compared with wages paid in this country.

Claims for alternative pensions made by widows will be similarly dealt with, but the high rate of Canadian pensions to widows, will prevent advantage being taken of this pension to any great extent.

(10) Treatment.

Imperial pensioners will have extended to them exactly the same facilities for treatment (including treatment in insanity and sanatorium cases) as for Canadian pensioners, including provision of allowances.

Cases falling under paragraph (4) will have treatment provided forthwith if the Canadian authorities are satisfied that the disability is due to or aggravated by military service, and provisional allowances will be paid until the award is confirmed by Chelsea Hospital.

(11) Training.

Arrangements as regards training must be settled with the Ministry of Labour.

(12) Artificial Limbs and Appliances.

The Canadian authorities will also arrange for the supply, renewal and repair of artificial limbs and appliances to the disabled men of the Imperial Forces.

(13) Supplementation, etc., of Pensions by the Special Grants Committee.

In Canada special grants to meet cases where the Canadian Regulations do not adequately provide for them, are made out of the Canadian Patriotic Fund. It is expected that this fund will also be applied to help Imperial Pensioners in special need, and that this cost will not fall on the British Exchequer.

(14) Life Certificates.

The Canadian authorities have agreed to continue the practice of obtaining a quarterly life certificate as required by the Appropriation Act for the purpose of identification of Imperial Pensioners in Canada.

(15) Duplicate Documents in the case of men.

The Ministry of Pensions, Chelsea Hospital, will arrange for duplicates of all documents relating to Imperial pensioners returning to Canada to be furnished to the Canadian Government so as to permit of re-boarding, etc., to be undertaken in Canada without delay.

(16) Pensioners leaving Canada or the United States of America.

Imperial pensioners receiving Canadian rates of pensions will on leaving Canada or the United States of America revert to the Imperial rates of pension.

(17) Funeral Grants.

In the event of the death of a disabled man, as a direct, or indirect, result of the disability for which he was pensioned, the Department of Soldiers' Civil Re-Establishment, at its option, may pay an allowance towards the cost of the funeral provided that such an allowance does not exceed the sum of $100, and is subject to the same conditions as govern the grant by the Canadian Government to their own pensioners.

Before offering to any man the benefit of Canadian rates or provisions, the Canadian Government will insist upon satisfactory proof being furnished by the man that he was resident in Canada before the outbreak of the war. The Canadian Government will forward the original evidence to the Ministry of Pensions or, if in any case that is impracticable, will furnish a certificate that satisfactory proof of residence has been given.

B. Officers, Commissioned Naval Warrant Officers, and Nurses resident in Canada.

(1) It is proposed that the Canadian Government shall extend to Imperial officers and nurses resident in Canada at the outbreak of war and who have returned to Canada, and who are in receipt of retired pay, the same facilities for treatment as are provided for Canadian pensioners, including the payment of allowances at Canadian rates. The officer or nurse will apply to the local representative of the Department of Soldiers' Civil Re-Establishment, who will medically examine him or her and arrange for the appropriate treatment. The local representative will communicate with the officer paying Imperial pensions at Ottawa, who will examine the papers and, if in order, instruct the Medical Director to pay to the officer or nurse the proper allowances.

In order to permit the above arrangements to be carried out it will be necessary in the first place to arrange that the retired pay of all Imperial officers and nurses resident in Canada should be paid by the officer paying Imperial pensions at Ottawa. The majority of such officers and nurses are already paid by him but in certain cases payment is made direct by the Assistant Paymaster General in London, and it is essential that in these cases the authority for payment should be transferred from the Assistant Paymaster General to the officer paying Imperial pensions at Ottawa.

It will also be necessary for the Officers' Branch of the Ministry of Pensions to furnish the Officer Paying Imperial Pensions at Ottawa with duplicates of the records of these officers and nurses.

Imperial officers in Canada who are not in receipt of retired pay but who are in need of treatment will similarly apply to the local representative who will have the officer or nurse boarded and arrange for the provision of the appropriate treatment and payment of provisional allowances if necessary. The local representative will communicate with the Officer Paying Imperial Pensions at Ottawa who will cable to the Officers' Section of the Ministry of Pensions for copies of the documents. Treatment will only be afforded to such officers or nurses if they can furnish reasonable evidence that they have served in the Imperial Forces during the present war. The arrangements as regards artificial limbs, etc., and funeral grants will also apply to officers and nurses.

C.—Disabled Men Resident in the United States of America.

(1) The pensions of Imperial Pensioners who were resident in the United States of America at the outbreak of war and who have since returned there are paid through the British Consuls. Arrangements for the provision of treatment to disabled men is also made through the British Consuls; but the system involves such delay and is unsatisfactory in other respects owing to the small acquaintance the Consuls must necessarily have with the Provisions of the British Royal Warrants.

The pensions of Canadian pensioners resident in the United States of America are paid direct from Ottawa and the Canadian Government arranges for the re-boarding and treatment of these pensioners through the local organization of the War Risk Insurance Bureau of the United States of America, or direct with local practitioners.

It is proposed that the Canadian Authorities shall take over the payment of the pensions of all Imperial pensioners (not pre-war pensioners, i.e. disabled men, and the widows and dependents of deceased men) resident in the United States of America and the provision of treatment for disabled men in exactly the same way as the Canadian Government provides for its own pensioners in the United States of America. Further, Imperial pensioners in the United States of America who were resident there before the war will be given the option of deciding whether they shall take pensions at the rates and under the conditions laid down by the Canadian Regulations or whether they shall retain the advantages of the British Royal Warrant. The Canadian Authorities will obtain satisfactory proof in each case that the man was resident in the United States of America before the War.

The Ministry of Pensions will furnish the Officer Paying Imperial Pensions, Ottawa, with a nominal roll of Imperial Disability Pensioners, widows and dependents resulting from the war of 1914-19 who were resident in the United States of America prior to August, 1914, and who still reside in that country and will instruct the British Consuls in the United States of America who are at present paying these pensioners to transfer the necessary documents and payment to the Officer Paying Imperial Pensions, Ottawa.

It is to be decided whether this arrangement shall take effect from first September next or from a subsequent date.

D.—Financial Arrangements.

It has been agreed that the Canadian Authorities shall make monthly claims upon the Ministry of Pensions for repayment for the sums disbursed under the above arrangements, such claims being supported by the necessary vouchers.

The Ministry of Pensions shall continue to allow the Government of Canada in respect of the services referred to herein 3 per cent of the actual amount of disbursement payable by the Officer Paying Imperial Pensions at Ottawa on behalf of the Ministry with the exception of treatment and training allowances.

With regard to the raising of funds it is suggested that the present arrangements whereby funds received by the Canadian Government in respect of money orders payable in the United Kingdom be made available for disbursements under these arrangements.

The proposals herein set forth are subject to the approval in Canada of His Excellency the Governor General in Council."

It will be seen that the foregoing memorandum provides for the extension of facilities to Imperial Pensioners and their dependents in Canada and the United States of America in several directions:—

(*a*) Option to take Canadian rates of pension instead of Imperial rates.

(*b*) Treatment allowances for ex-members of the Imperial Forces at Canadian rates.

(*c*) Increase of funeral grant up to $100.

(*d*) Provision of artificial appliances to ex-members of Imperial Forces.

In carrying out the proposals outlined, the Officer Paying Imperial Pensions will act as a Liason Officer. It is suggested that his office be removed from the jurisdiction of the Department of Militia and Defence and placed directly under that of the Board of Pension Commissioners.

Canadian Government funds need not be utilized in the payment of pensions or other allowances, as all payments will be made and accounts settled by the Officer Paying Imperial Pensions out of British Government Funds drawn by him from the Department of Finance as at present.

The British Government will pay 3 per cent on all pension disbursements by the Officer Paying Imperial Pensions, which will meet the cost of the maintenance of his office.

Respectfully submitted,

E. H. SCAMMELL.

SCHEDULE "C."

Report on Treatment of Ex-Imperial Soldiers in Canada and the United States of America and payment of treatment allowances at Canadian rates.

The arrangement agreed with the Ministry of Pensions on the above subject is set forth in the following letter, dated 1st August, 1919, addressed by me to the Secretary of the Ministry of Pensions:—

With reference to the last paragraph of your letter of the 31st ultimo, No. 16769, the following is the organization existing in Canada for the treatment of officers and men who have been retired or discharged from the Canadian Forces, and the procedure which it is proposed to put into operation for the treatment of officers and men who have served in the Imperial Forces.

2. Canada is divided into eleven districts, and at the Headquarters of each district there is a Medical Director and his staff. The Medical Service is further sub-divided by the appointment of Medical Officers in each Town of any size in each district.

3. The Department of Soldiers' Civil Re-Establishment has a number of hospitals under its direct control for general treatment and for the treatment of tuberculosis. It also has definite arrangements for accommodation in a large number of General Hospitals throughout Canada.

4. The following procedure based upon that in force for ex-members of the Canadian Forces will be carried out in respect of ex-members of the Imperial Forces whether officers or men:—

(*a*) Any ex-member of the Imperial Forces suffering from a disability which he considers to be due to service may apply to the nearest Local Medical Officer of the Department of Soldiers' Civil Re-Establishment.

(*b*) If it is apparent that immediate treatment is required for what appears to be a war disability the Local Medical Officer can give the treatment or order the man to hospital.

(*c*) Immediately an ex-member of the Imperial Forces reports to a Local Medical Officer for treatment that Officer will communicate with the District Medical Director in order to obtain particulars regarding the man's medical history while in the Service, and the District Medical Director will telegraph to the officer Paying Imperial Pensions in Ottawa for the necessary copies.

(*d*) If it is found that the disability from which the ex-member of the Imperial Forces is suffering is a result of war service he will be placed on the same pay and allowances as ex-members of the Canadian Forces of similar rank. This allowance will be continued as long as treatment is required which prevents the man from following a gainful occupation. The pension, if any, will be continued, but will be deducted from the allowances.

(*e*) If an ex-member of the Imperial Forces requires occasional treatment, such as the dressing of a wound, massage, removal of pieces of shrapnel, etc., which does not require him to stop his civilian occupation, he will be entitled to attend at the office of the Medical Officer according to direction and receive such treatment or medicine as he may require. An allowance of $1 for each such treatment may be granted provided that the patient suffers a financial loss from such attendance.

(*f*) Ex-members of the Imperial Forces suffering from tuberculosis requiring sanatorium treatment will be placed in a sanatorium. In accordance with the Canadian practice when such member is discharged from the sanatorium he will be granted 100 per cent pension for six months at the conclusion of which he will be re-examined.

(*g*) If it is decided that the ex-Imperial Soldier will do better at his own home than in Hospital he will be visited periodically by a Medical Officer of the Department and granted a further 80 cents per day for subsistence allowance. Men in this category are known as "Class 1 Out-patients". Men in the category referred to in sub-para. (e) above are known as "Class 2 Out-Patients".

(*h*) Insane ex-members of the Imperial Forces will be placed either in Hospitals for the insane operated by the Department or in a Provincial institution. The maintenance paid in the latter case is the net cost to the Province. These men will not be pensioned but if their insanity has been caused or aggravated by service their dependents will be granted allowances equal to the amount they would have received had the man been killed.

(*i*) The Department having established a central factory for the provision of artificial limbs and orthopædic appliances, with fitting depots in all parts of Canada, for the provision, renewal and maintenance of such appliances, ex-members of the Imperial Forces will be entitled to apply to such fitting depots when they require renewal of or repair to artificial appliances. Any such ex-member may be granted certain expenses and allowances to cover his out-of-pocket expenses and loss of time.

5. In view of the reciprocal arrangements made with the Ministry of Pensions the Department will place at the disposal of ex-members of the Imperial Forces its entire facilities, including the services of its Medical Officers, accommodation in its Hospitals, etc. The Department will charge the Ministry of Pensions its out-of-pocket costs for treatment and maintenance in Hospitals or Sanatoria or at the man's own home. The Department will not charge overhead expenses such as the salary, or portion of the salary, of its regular Medical Officers, as these Officers would necessarily be employed whether ex-members of the Imperial Forces received treatment or not. In the treatment of individual cases where the Department has no regular representative, or where local practitioners are employed on a schedule of pay according to work done, it will be necessary to make this a charge against the Ministry of Pensions as it is made a special charge against the Department.

6. The charges will include the following:—

(*a*) Cost of hospital treatment. Where such cost is paid to an institution not controlled by the Department it will be the actual amount paid out. Where the man is undergoing treatment in a hospital operated by the Department it will be the same amount as that charged to the Canadian Government for the treatment of ex-Canadian officers and men and will be based upon absolute cost.

(*b*) All allowances paid direct to the man in addition to pension, at the same rates as those paid to ex-members of the Canadian Forces.

(*c*) Travelling expenses, etc., at the same rates as those paid to ex-members of the Canadian Forces.

(*d*) The net cost of artificial limbs or other appliances.

(*e*) The net cost of transportation incurred by the Canadian Government in respect of ex-members of the Imperial Forces.

7. All accounts will be rendered to the Ministry of Pensions through the Officer Paying Imperial Pensions, Ottawa, who will pay the accounts and forward the necessary vouchers to the ministry.

8. Other matters regarding the furnishing of the proceedings of Medical Boards, and detailed arrangements regarding the rendering of accounts are included in the agreement which is being drawn up by Mr. Hore and Mr. Cole of the Ministry of Pensions.

9. With regard to the treatment of ex-members of the Imperial Forces resident in the United States of America. The Government of Canada has entered into a reciprocal arrangement with the Government of the United States for the treatment of ex-members of the Canadian Forces resident in that country when such men develop a post discharge disability due to or aggravated by war service. The Department is willing, if so desired by the Ministry of Pensions to undertake to deal with all such members of the Imperial Forces in the United States in exactly the same way as it is doing for its own men. The War Risk Insurance Bureau at Washington is charged with the work in the United States, and accounts will be submitted to the Department for payment. Whatever is paid out in this regard will be charged by the Department to the Ministry of Pensions through the Officer Paying Imperial Pensions, Ottawa. Similar allowances to those paid to ex-members of the Canadian Forces will be paid to ex-members of the Imperial Forces.

10. The term "ex-members of the Imperial Forces" or the term "man" used in this letter apply to officers as well as to non-commissioned officers and men.

11. The foregoing arrangements are subject to confirmation and approval in Canada by His Excellency the Governor General in Council.

Respectfully submitted,

E. H. SCAMMELL.

SCHEDULE "D."

Report on Provision of treatment to ex-members of Canadian Forces resident in the United Kingdom with allowances of British rates at the expense of the Canadian Government.

Subject to your approval the following draft circular, embodying the necessary instructions regarding treatment of N.C.O.'s and men, will be despatched to the local War Pensions Committees in the United Kingdom by the Ministry of Pensions. In the case of officers the arrangement set forth in the memorandum following the circular will be operative. In the meantime any ex-members of the Canadian Forces in the United Kingdom requiring treatment will be dealt with in accordance with these instructions:—

DRAFT CIRCULAR.*

Provision of Medical and Surgical Treatment to men discharged from Canadian Forces and Resident in the United Kingdom.

SIR,—I am directed by the Minister of Pensions to state for the information of your Committee, that he has arranged with the Canadian Authorities, that the facilities for the provision of necessary medical and surgical treatment which apply in the case of men discharged from Imperial Forces, shall be extended to men discharged from Canadian Forces who are residing in the United Kingdom. The Minister is confident that he may rely upon the co-operation and assistance of Local War Pensions Committees in this connection, and I am accordingly to acquaint you with the procedure which it will be necessary to follow:—

1. When a man discharged from Canadian Forces applies to a War Pensions Committee for treatment, he should be referred to a Medical Referee for examination, and an opinion on Form M.R.1, as to the nature of the disability from which the man is suffering, whether it is connected with service, what form of treatment (if any) is required, and whether or not the man is able to work. Where a recommendation of treatment is made the Committee should forward a copy of this certificate to the Board of Pension Commissioners for Canada, 102 Oxford Street, W. 1, asking for instructions. The Board will advise the Committee whether the man is eligible. If he is, the Committee should give effect to the Medical Referee's recommendation.

In any case, however, in which the provision of treatment is deemed to be urgent, the War Pensions Committee should act upon the Medical Referee's certificate forthwith and, at the same time, notify the Board of Pension Commissioners that they have done so and await the Board's further instructions.

2. In advising the Committee of the man's eligibility, the Board of Pension Commissioners will also furnish particulars regarding the total pension payments being made by the Board in respect of the man, which will continue to be made to him directly by the Board while he is under treatment. The Board will further supply particulars of the man's dependents. If the man while under treatment in an institution, has been notified to be unable to work at a remunerative occupation and his pension is less than the amount which would be payable to him by way of treatment allowances under the Royal Warrant, the Committee should supplement the payment to the man, so as to bring it up to the equivalent of full treatment allowances. In this connection, it should be noted that any payment made by the Committee will, in the case of a man in an institution, be subject to deduction, so far as that payment will admit, of 7 shillings per week on account of maintenance.

3. If in any case the War Pensions Committee is advised by the Board of Pension Commissioners that the man is still in receipt of Army Pay and Allowances the Committee will arrange to provide the necessary treatment but will not supplement the payment to or in respect of the man himself.

4. In any case in which the man is able to work while under treatment, he may be compensated for loss of remunerative time, in accordance with Instruction 40 of the Instructions and Notes on the Treatment and Training of Disabled men, 1917.*

5. Where the certificate of the Medical Referee contains a recommendation that General Practitioner Treatment should be provided, the Committee should ascertain whether the man is eligible for this form of treatment under the National Insurance (Health) Acts. In any case in which the Committee is advised by the Insurance Committee that the man is not so eligible, they should make arrangements with a Local Practitioner for this form of treatment to be provided and satisfy themselves that the charges are reasonable.

6. In cases of tuberculosis, if the man is ineligible for Sanatorium Benefit by reason of not being insured, the War Pensions Committee should request the Insurance Committee to make arrangements for the provision of the necessary treatment on behalf of, and at the cost of, the War Pensions Committee.

7. When treatment has been arranged the Committee should forward to the Board of Pension Commissioners a Form M.S.D. 6 adapted as required, showing the payments (if any)

* See Appendix III for final copy of circular issued by Ministry of Pensions, after approval of arrangements by the Privy Council of Canada.

which will be made by them, and stating also the charges being incurred in respect of the cost of treatment. When treatment terminates, the Committee should forward to the Board Form M.S.D. 7. The Board will thereupon reimburse the Committee the expenditure incurred by them on the man's account.

8. In any case in which it is brought to the notice of the War Pensions Committee that a man discharged from Canadian Forces has been certified to be insane, they should communicate with the Board of Pension Commissioners furnishing all particulars available.

9. Where a Committee receives a recommendation of treatment made by a Medical Board, the treatment should be arranged and the usual notification on Form M.S.D. 6 should be made to the Board of Pension Commissioners, showing the charges which will be incurred on account of treatment. At the same time, the Committee should, if the man is unable to work, inquire as to the amount of his pension, and regarding his dependents, in connection with the question of supplementary payments.

10. Any case of refusal of treatment should be reported by the Committee to the Board of Pension Commissioners explaining the action taken by the Committee with a view to persuading the man to accept, and stating the reasons given by the man for refusal. The Board of Pension Commissioners will advise the War Pensions Committee of any action they desire taken in the matter.

**Instruction 30.—Special Allowances in Certain Cases of Out-patient Treatment.*

MEMORANDUM.

Provision of necessary medical and surgical treatment to officers discharged from Canadian Forces and residing in the United Kingdom:

The Ministry of Pensions undertakes to arrange for the provision of necessary medical and surgical treatment for officers retired from Canadian Forces and residing in the United Kingdom in accordance with the following procedure:—

1. Where an officer retired from Canadian Forces applies to the Ministry of Pensions for treatment he will be referred to a Medical Board or to a Medical Referee for an opinion as to the nature of the disability from which the officer is suffering; whether it is connected with service; what form of treatment (if any) is required; and whether or not the officer is able to work. Where a recommendation of treatment is made, the Ministry will forward a copy of the certificate to the Board of Pension Commissioners for Canada, 103 Oxford Street, W. 1, asking for instructions. The Board will advise the Ministry whether the officer is eligible. If he is, the Ministry will give effect to the treatment recommendation.

In any case in which the provision of treatment is deemed by the Ministry to be urgent, the treatment will be provided immediately, and the Board of Pension Commissioners will be advised accordingly and asked for instructions.

2. In advising the Ministry of an officer's eligibility for treatment, the Board of Pension Commissioners will also furnish particulars of the total pension payments being made by the Board in respect of the officer, which will continue to be paid to him directly by the Board while the officer is under treatment. The Board will further supply particulars of the officer's dependents. If the officer, while under treatment or while awaiting treatment in an institution, has been certified to be unable to work at a remunerative occupation and his pension is less than the amount which would be payable to him while under treatment in accordance with his rank under the Royal Warrant for the retired pay of officers disabled, the Finance Department of the Ministry will supplement the payment to the officer so as to bring it up to the allowances under the Royal Warrant. Any payment, however, to be made by the Ministry will be subject to the reduction provided by the Warrant on account of maintenance in an institution.

3. In any case in which the officer is able to work while under treatment, the Finance Department of the Ministry will pay him compensation for loss of remunerative time occasioned by treatment at a rate not exceeding 2 shillings an hour up to a maximum of 20 shillings a week.

4. Where it is certified that general practitioner treatment is necessary and adequate, the Ministry will arrange for the provision of this form of treatment and will defray charges in accordance with the principle applied in the case of an officer discharged from Imperial Forces.

5. When treatment has been arranged in an institution or in circumstances which necessitate the officer living away from home, the Ministry will notify the Board of Pension Commissioners of the date of commencement of treatment, and of the name of the institution in which treatment is being provided or of the officer's new address.

6. Where a case is first brought to the notice of the Ministry by the receipt of a recommendation of treatment, made by a Medical Board, the treatment will be arranged and the necessary inquiry in accordance with paragraph 1 will be made of the Board of Pension Commissioners, the date of commencement of treatment, and particulars in accordance with para-

* Where any treatment provided by the local Committee is out-patient treatment and does not oblige the man to live away from home or otherwise render him incapable of providing for his own support and that of his family, the allowances specified in Instruction 34 shall not be payable; but the Local Committee shall, if the man applies and shows that such treatment involves a loss of wages or travelling expenses or both, and they are satisfied as to the facts, pay to the man by way of supplementary allowance an amount in respect of actual loss of wages not exceeding 1s. an hour up to a maximum of 10s. per week, for any time occupied in obtaining such treatment together with his reasonable travelling expenses; provided that for this purpose the Local Committee shall obtain a statement from the man's employer as to the time and wages so lost.

graph 5 being furnished. The Board will thereupon notify the Ministry in accordance with paragraph 2 with a view to the Ministry being able to determine to what extent, if at all, supplementary payment should be made to the officer.

7. When treatment terminates the Ministry will notify the Board of Pension Commissioners of the date of termination and report as to the treatment provided ,and as to the officer's condition at the conclusion of treatment.

8. In any case in which an officer refuses to undergo the treatment certified to be necessary in his interests, the Ministry will notify the Board of Pension Commissioners accordingly. The Board will advise the Ministry of any action which they desire should be taken.

9. All matters relating to the provision of treatment will be dealt with by the Medical Service Department [M.S. 2 (0)]. All financial matters connected with the provision of treatment will be dealt with by the Finance Department of the Ministry. The Finance Department will make a return to the Board of Pension Commissioners quarterly, furnishing the particulars of officers in respect of whom accounts have been paid, and showing the amount of the charges defrayed in each case and the sums, if any, paid to or in respect of the officer himself.

10. If in any case the Ministry is advised by the Board of Pension Commissioners that an officer is still in receipt of army pay and allowances the Committee will arrange to provide the treatment but will not supplement the payment to or in respect of the officer himself.

The following points in the foregoing circular and memorandum should be noted:—

(*a*) No man will be granted treatment, unless the case is urgent, until the Board of Pension Commissioners has had an opportunity to pass upon his eligibility.

(*b*) Allowances during treatment will be at British rates.

(*c*) Paragraph 3 of the draft circular and paragraph 10 of the memorandum have been inserted for the following reasons:—

(1) There are at present a few men in British hospitals who are receiving total disability pensions from the Board of Pension Commissioners, and as the treatment will be completed in the near future, it was not considered wise to change the allowances.

(2) As referred to in Schedule "G" we have taken over from the O.M.F.C. about 100 officers and men for further continuous treatment and these will be paid their regular scale of pay and allowances until treatment is concluded.

With regard to the insane, the number to be dealt with is, happily, small, and the matter has been left in the hands of the Board of Pension Commissioners. All English cases will be referred by that board to the English Board of Control, 66 Victoria street, London. This body has jurisdiction over the hospitals for the insane in England. In respect to Scotland and Ireland, all cases will be referred to the Scottish Board of Control, Edinburgh, and the Under Secretary of State, Dublin Castle, Dublin, respectively.

All insane in the United Kingdom will be dealt with under P.C. 1993, and the sum of $350 per annum has been fixed as the maximum allowance for maintenance. If in special cases a higher cost is indicated, the matter is to be referred to this department.

With regard to men suffering from venereal disease the following extract from a letter from Mr. J. A. Cutforth, of the Ministry of Pensions, will explain the situation in the United Kingdom:—

As regards the question of whether or not we should regard a man suffering from venereal disease as eligible for treatment at the cost of the Ministry, I would explain that in the ordinary course necessary treatment for this disability is provided free of cost to soldier and civilian alike at out-patient clinics established by the Public Health authorities. Ordinarily therefore, no question arises to this Ministry regardng expenses of treatment in such cases. The question may, however, arise whether a man, while receiving such treatment, is eligible for treatment allowances. This question is determined in accordance with the Awards Branch decision on whether this disability has been held to be due to or aggravated by service, or, if it was the invaliding disability and regarded as non-attributable, whether the Awards Branch has awarded a gratuity. In any case in which no award was made for the reason that the disability has been regarded as being due to misconduct we should not pay treatment allowances; otherwise we should regard the man as eligible.

Respectfully submitted,

E. H. SCAMMELL.

SESSIONAL PAPER No. 14

Confidential. Form M.R. 1.

TREATMENT CERTIFICATE.

PARTICULARS OF MAN. (To be filled up by the Secretary of Local Committee.)

Surname ..... Christian Names .....

Present Address .....

.....

Regiment (or Ship) .....

Age ..... Rank ..... Regt. No. ..... Date of Discharge .....

Disability for which discharged ..... { due to / aggravated by / not due to } service.

.....War Pensions Committee. .....Secretary.

CERTIFICATE OF MEDICAL REFEREE.

I have read all the documents submitted to me relating to the above-named man, and have examined him to-day. I am of opinion that:—

(*a*) He is suffering from.....

(*b*) His present ailment is due to or is a consequence of the disability for which he was discharged.

(*c*) He { is unable to work / should, on medical grounds, not be allowed to work / is able to work } at a remunerative occupation.

(*d*) He is not likely to be able to work at a remunerative occupation for..... weeks from this date.

(*e*) The treatment recommended overleaf / No treatment. is necessary in the man's interests.

RECOMMENDATION.

1. I recommend that he receive the following form of treatment

(*a*) as in-patient / out-patient

at a General Hospital, viz.:—

at a Special Hospital, viz.:—

(*b*) Convalescent Home.

(*c*) Massage and Electricity { at.....Hospital. / at Home.

For such period as may be deemed necessary by the medical practitioner in attendance.

(*d*) Home treatment under his own doctor for.....weeks.

2. (*a*) He should be referred to the Local Insurance Committee for an opinion as to treatment required.

(*b*) He should be supplied with the undermentioned *surgical appliance / artificial limb :

*Strike out one not applicable.

Signature .....

Medical Referee for .....

Date .....

Form M.S.D. 6.

NOTIFICATION OF COMMENCEMENT OF TREATMENT.

.....Local Committee.

Address.....

Date.....

Sir,—I have to report that the undermentioned man has been given treatment under the Instructions of the Ministry, for an incapacity the same as or connected with the disability on account of which he was discharged from the $\frac{\text{Navy}}{\text{Army}}$

Name ....
(Surname first.)

Number and Ship or Regiment $\frac{\text{Rating}}{\text{Rank.}}$ .....

Address ....

Nature of Disability ....

Treatment allowed:—

In-patient in ....

Strike out whichever of these are inapplicable.

Out-patient at .....

Other treatment .....

Treatment has been allowed by the Local Committee for a period of.....

.....

A.

The above-named man during the period will be living away from home or will otherwise not be able to contribute to the support of himself and his family. I have, therefore, enclosed the identity certificate and I propose, subject to notification by you to the contrary, to pay as from Wednesday next, the $\frac{\text{inst.}}{\text{prox.}}$ the following net *allowances after deduction of

* That is, the amount of allowance, exclusive of the deduction made for the cost of the man's maintenance.

s. per week towards cost of maintenance:—
s. d. to the man.
s. d. to his wife.
s. d. to his children.

B.

The above-named man during the period will be living at home and receiving a wage while under out-patient treatment and will therefore be entitled only to an allowance under Article 6 (5) of the Royal Warrant.

I am, sir,
Your obedient servant,
Secretary or Clerk.

The Superintendent,
Pension Issue Office,
Baker Street, W.1.

Form M.S.D. 7.

NOTIFICATION OF TERMINATION OF TREATMENT.

..... Local Committee.

Address.....

Date.....

SIR,

I have to inform you that the man described below,

Name .....

(Surname first).

Number, and Ship or Regiment $\frac{\text{Rating}}{\text{Rank}}$ .....

will complete / has completed } his course of treatment on the (Date).....

or,

has failed to complete the course of treatment in the following circumstances:—

State whether man acted contrary to medical advice or failed to carry out rules of Institution, etc. See instructions 16 and 17.

.....

.....

.....

.....

.....

.....

.....

*For cases in which man has been discharged for misconduct, or has given up treatment unreasonably.

*I have therefore withheld the balance (s. d.) of allowances otherwise due to him.

The last weekly payment of allowances { will be / was } made on Wednesday, the.....and payment of Pension at the rate of..... will be made weekly from.....until the man's Identity Certificate and notification of the date on which Pension will be resumed centrally are received by me.

State whether materially improved or otherwise as the case may be.

As a result of the man's treatment his condition is medically certified to be

.....

.....

.....

I am, Sir,

Your obedient Servant,

Secretary or Clerk.

THE SUPERINTENDENT,
Pension Issue Office,
Baker Street, W.1.

SCHEDULE "E."

Report on provision, renewal and repair of artificial limbs and appliances to ex-members of the Canadian Forces in England, also the provision of dental treatment.

Subject to your approval the following circular* will be despatched by the Artificial Limb Branch, Ministry of Pensions to the local War Pensions Committees:—

I am directed by the Minister of Pensions to state, for the information of your Committee, that he has arranged with the Canadian Authorities that the facilities for the provision of Artificial Appliances, including legs, arms, trusses, glass eyes, orthopaedic boots, dentures and dental treatment, etc., which apply in the case of men discharged from the Imperial Forces, shall be extended to men discharged from the Canadian Forces who are resident in the United Kingdom.

The Minister is confident that he may rely upon the co-operation and assistance of Local War Pensions Committees in this connection and I am accordingly to acquaint you with the procedure which it will be necessary to follow.

(1) When a man discharged from the Canadian Forces applies to a Local War Pensions Committee for the supply repair or renewal of artificial appliances as defined above, the Committee will follow the procedure prescribed in respect of a British pensioner but before actually issuing the order for any limb, appliance of treatment will report the case to the Board of Pension Commissioners for Canada, 103, Oxford Street, London, W.I., and the Board will then advise the Committee whether the man is eligible. If he is, the Committee will arrange for what is required on the same lines as if the man were a British Pensioner.

(2) If as the result of the man's application the Committee considers that he should enter an Institution or that he will be unable to work at a remunerative occupation while waiting for such repairs or renewals, the Committee will report the fact in making its reference to the Board of Pension Commissioners and the Board will furnish particulars regarding the man's pension, the payment of which will continue to be made to him directly by the Board. The Board will further supply particulars of the man's dependents. If his pension is less than the amount which would be payable to him by way of treatment allowances under the Royal Warrant, the Committee should supplement the payment to the man so as to bring it up to the equivalent of full treatment allowances. In this connection it should be noted that any payment made by the Committee will in the case of a man in an Institution be subject to a deduction so far as that amount will admit, of 7 shillings per week on account of maintenance.

(3) In any case in which the man is able to work while waiting for the supply or renewal of an orthopaedic appliance he may be compensated for the loss of remunerative time, in accordance with Instruction 40 of the Instructions and Notes on the treatment and training of disabled men, 1917.

(4) When the supply or renewal of an Orthopaedic appliance has been arranged, the Committee should forward to the Board of Pension Commissioners for Canada a statement showing the payments (if any) which shall be made to them and stating also the charges being incurred in respect of the cost of such supply or renewal. When the work has been done the Committee should notify the Board which will thereupon reimburse the Committee the expenditure incurred by them on the man's account.

The foregoing circular does not refer to Commissioned Officers, who will apply direct to the Board of Pension Commissioners or to the Artificial Appliances Branch of the Ministry of Pensions.

It will be noted that dental treatment is included in the foregoing circular. The Ministry of Pensions (Artificial Appliances Branch) has made arrangements with civilian practitioners in all parts of the United Kingdom to complete dental treatment for ex-members of the Imperial Forces. The circular places ex-members of the Canadian Expeditionary Force in the same category. The Ministry of Pensions has been informed that every man discharged from the C.E.F., is furnished with a card headed, "Dental examination on discharge," also a paper headed "Dental Certificate for Demobilization." It will be quite easy, therefore, for the dental officer connected with the local War Pensions Committees to ascertain the eligibility of the man for further treatment.

Respectfully submitted,

E. H. SCAMMELL.

* After approval of arrangements by the Privy Council of Canada this circular was combined with circular as per Schedule "D". See Appendix III.

SESSIONAL PAPER No. 14

SCHEDULE "F."

*Report on provision of training and payment of training allowances to ex-members of the Canadian Forces resident in the United Kingdom, and of ex-Imperial Forces resident in Canada**

All re-training is now conducted in England by the Department of Labour, though the machinery of the local War Pensions Committees is utilized for investigation and subsequent placing under training. The following procedure has been approved by the Ministry of Labour regarding re-training of disabled ex-members of the Canadian Forces in the United Kingdom:—

A disabled Canadian seeking training must first be referred to the local War Pensions Committee. This Committee will investigate the case, referring as it is found necessary to the Board of Pension Commissioners for Canada, 103 Oxford Street, London, W. 1, and if the man is found to be suffering from a disability due to or aggravated by war service which prevents him from following his pre-war occupation, they will forward a statement of the case, particularly stating the amount of disability pension, if any, the man is receiving from the Canadian Authorities, to the Divisional Director of Training, who will proceed to deal with it as any other case, except that the net weekly payment made to the man must be diminished by the amount of the pension he is receiving.

With regard to re-training of ex-members of the Imperial Forces in Canada, the following is a copy of a statement by the Ministry of Labour for the approval of the Treasury:—

(*a*) Authority to the Ministry of Labour to make payment to the Canadian Government of sums expended by them in connection with the training in Canada of pre-war British residents in Canada and the U.S.A., who enlisted in the Imperial Forces or Reservists who rejoined from those countries, the payments to be made in such cases to be on the same scale as those paid to other persons similarly trained by the Canadian Government, the cost of the training to be recovered from the Imperial Government.

(*b*) To train, on behalf of the Canadian Government discharged and disabled soldiers from the Canadian Forces resident in the United Kingdom, the payments to be made in such cases to be on the same scale as those paid to other persons similarly trained by the Ministry of Labour, the cost of the training to be recovered from the Canadian Government.

This matter was considered by the War Cabinet on the 16th July, and it was then decided that a reciprocal arrangement should be made with the Canadian Government whereby they would train pre-war British residents in Canada and the U.S.A. who enlisted in the Imperial Forces or Reservists who rejoined from those countries; and that these men should be allowed the option of taking the pensions, allowances and medical treatment and training, and all other privileges at the same rates and on the same terms as are provided by the Canadian Orders in Council in place of the rates of pensions, etc., accorded under the Royal Warrants.

It is understood that the Canadian Government do not propose to charge the Imperial Government with (1) Administrative expenses, (2) capital expenditure; they propose to charge in respect of the men in training (*a*) allowances payable to the men, (*b*) cost of training. Similarly the Imperial Government will make no charges under (1) and (2) in respect of ex-members of the Canadian Forces trained in this country.

It is estimated that the average weekly payment to each of the men is about £3 15s. per week, and the cost of training about £1 per week. As the period of training does not as a rule exceed nine months the total cost in respect of each trainee is probably not more than £190 no provision being as a rule made for the obtaining of learners' wage.

Men who desire training in Canada under the above provisions have to make application either 12 months after the date of demobilization or 12 months after the date of the Order in Council issued by the Canadian Parliament dated April last.

The number of Canadians to be trained in the United Kingdom is expected to be quite small, as they will only consist of men (*a*) who are discharged in this country (this is only done when they have a position to go to on discharge), and (*b*) who, although discharged in Canada, have all their home ties and associations in the United Kingdom. The latter class of men pay their own expenses back to this country.

The necessary accounting arrangements are being considered.

Respectfully submitted,

E. H. SCAMMELL.

* For consummation of these arrangements see Appendix III.

SCHEDULE "G."

Report on transfer to British hospitals of members of the Canadian Expeditionary Force for further continuous treatment.

The Overseas Military Forces of Canada were desirous of closing their Orpington and Petrograd hospitals on the 15th August and it was necessary to make immediate arrangements in other institutions for the accommodation of about 100 officers and men, who were receiving treatment in these hospitals. Unless this could be done very heavy expense to the Government of Canada, for the maintenance of these hospitals with only a limited number of patients, would result.

Before leaving England I, therefore, arranged that all patients, who were to be left in England by the O.M.F.C., should be transferred to a hospital at Shepherd's Bush, London, under the jurisdiction of the Ministry of Pensions. The officers are being retired and men discharged, but they will be taken on by this department as from the date of retirement or discharge and put on pay and allowances by the Board of Pension Commissioners. This is only a temporary measure.

Respectfully submitted,

E. H. SCAMMELL.

SCHEDULE "H."

Report on procedure respecting discharge of Blinded Canadians in England, and their subsequent transfer to Canada.

It was the custom of the Overseas Military Forces of Canada to take over a man who had undergone training at St. Dunstan's, as soon as his training was completed and place him in a hospital where all was strange to him, pending his return to Canada. He might remain there for weeks. Further, married men were not allowed to return to Canada with their wives, as all blinded soldiers were returned on hospital ships. At Captain Baker's instance a conference on these matters was held with the Deputy Minister, O.M.F.C., and the following letter was subsequently sent by me to the Deputy Minister:—

With reference to the marginally noted subject and our conference regarding the same on the first instant, Captain Baker of this Department has secured the information required, and it is requested that your approval may be given to the following arrangements which were under discussion.

Attached hereto is a complete list of the officers and men at present undergoing training at St. Dunstan's and who are still on your strength. The list has been divided into two sections, one containing the names of all those officers and men who will be returning to Canada alone, and the other the names of those officers and men who will be accompanied by their wives, or wives and children. The list is further subdivided according to the months of the year in which course is likely to be completed, and at which times the men in question may be returned to Canada. The dates of completion of courses as given are estimated as closely as possible after due consideration of all factors, and it may happen in a small percentage of cases that arrangements for return will be requested slightly before or slightly after the dates given due to unforeseen contingencies. It may also happen that some men after further consideration will decide to take their discharge in England, in which case the Government of Canada will be relieved of the responsibility for their return at any time in the future.

With regard to the arrangements to be made for all members of the forces herein concerned it is proposed, subject to your approval, as follows:—

(*a*) That all Canadian blinded soldiers who have been transferred from hospitals in England to St. Dunstan's for training should be considered as entirely convalescent and left under the supervision of the St. Dunstan's authorities until such time as actual passage to Canada has been secured.

(*b*) That for single men passages on hospital ships will be quite satisfactory as in the past, but that after the service of the hospital ships has been discontinued first class passages on regular liners should be provided. This last provision is considered necessary in view of the fact that these men will experience considerable difficulty in the cramped and inconvenient quarters provided for second and third class passages. Deck space is negligible, and various obstacles in passages, etc., render it difficult for the men to find their way about.

(c) That where necessary escorts should be provided, but that as far as possible the services of other returning soldiers should be utilized. One sighted escort should accompany two or three blinded soldiers. In cases where the blinded soldiers are married their wives should be considered as escorts, and first class passages provided in each case. Where a returning soldier is utilized as an escort it is suggested that a lump sum of say $25 be granted to him.

Arrangements are being made to have St. Dunstan's forward notification as to the earliest possible date on which each passage should be provided, and if you could arrange to advise this office as to the actual date on which a man or men should be prepared to travel by train to the point of embarkation, the St. Dunstan's authorities will see that the man or men are present to take the proper boat or train at the time specified by your office. Communications in this connection will be sent to you through this office, to which your replies should also be addressed.

I am assured that Sir Arthur Pearson and his staff are ready to co-operate in every way possible in order that arrangements for Canadian blinded soldiers may be as complete and convenient as possible until such times as they are due to be transferred from the precincts of St. Dunstan's to their boat.

Your consideration of the above will be much appreciated, and it is hoped that the outline of arrangements as submitted may meet with your approval.

No reply was received by me to the above communication, but I believe that the arrangements outlined will be carried out.

Respectfully submitted,

E. H. SCAMMELL.

SCHEDULE "I."

Report on proposed reciprocal arrangements with the Governments of Australia, New Zealand and France.

In accordance with instructions received from the Deputy Minister, I entered into negotiations with the above Governments. Attached are copies of two letters—one to the High Commissioner for Australia and the other to Lieutenant-General Baron Corvisart, Chief of the French Military Mission in England. A letter similar to that sent to the High Commissioner for Australia was sent to the New Zealand authorities.

In each case the proposals have been sent to the Governments concerned, and a request has been made that the replies be forwarded direct to Ottawa.

To the High Commissioner for Australia, London.

July 14, 1919.

Referring to my interview with General Sir Reginald Howse and later with Mr. Box, I am directed on behalf of the Department of Soldiers' Civil Re-Establishment to submit the following proposal, subject to the approval of His Excellency the Governor General in Council at Ottawa.

2. The Department of Soldiers' Civil Re-Establishment has been empowered by the Government of Canada to give treatment and training to ex-members of the forces of any of the Dominions, and, with the approval of the Governor General in Council, to make arrangements with the Government of any of His Majesty's Dominions for reciprocal treatment.

3. I enclose for your information copy of the Order in Council, P.C. 387, dated February 24, 1919, and I would direct your attention especially to Clauses 1, 2, and 3.

4. It is anticipated that from time to time ex-members of the Canadian Forces may settle in Australia and also that ex-members of the Australian Forces may settle in Canada. It is very desirable that each Government be empowered by the other to give to such men medical care and treatment should they suffer a recurrence of a war disability, and be unable to continue employment as a result of war service.

5. I am directed to propose that any ex-members of the Canadian or Australian Forces resident in the country of the other be granted by each Government treatment or vocational training, or the renewal of, or repairs to, artificial appliances, if the same are required as a result of war service.

6. It is not proposed that the Department of Soldiers' Civil Re-Establishment shall charge the Government of Australia any overhead expenses such as the salary or portion of the salary of its regular medical or vocational officers, as these officers would necessarily be employed whether ex-members of the Australian Forces received treatment or training or not. But in

the treatment of individual cases where the Department has no regular representative and local practitioners are employed on a schedule of pay according to work done it would be necessary to make this a charge against the Government of Australia as it is made a special charge against this Department. It is submitted that similar arrangements might be made by the Government of Australia.

7. With regard to the supply, renewals of, or repairs to artificial limbs, including minor orthopaedic appliances, it may be stated that the Department has established an Artificial Limb Factory in Toronto, with fitting depots in all the principal centres throughout Canada. The Department will be prepared to treat ex-members of the Australian Forces requiring artificial appliances, or the repair of those which have already been supplied, at cost price, subject to similar arrangements being made by the Government of Australia.

8. The procedure in Canada is as follows:—

(*a*) The country is divided into eleven districts.

(*b*) At the Headquarters of each District there is a District Medical Director and Staff, a District Vocational Officer and Staff.

(*c*) The medical service is further sub-divided by the appointment of Medical Officers in each town of any size in each Unit.

(*d*) When a discharged soldier or sailor falls ill he is directed either by the Local Branch of the Returned Soldier Commission or of the Great War Veterans or other Veterans' Association to apply to the nearest Medical Officer of the Department of Soldiers' Civil Re-establishment. If it is apparent that the man requires immediate treatment for what appears to be a war disability the local Medical Officer can give the treatment or order the man to hospital.

(*e*) Immediately a man reports to the local Medical Officer for treatment, that officer communicates with the District Medical Director in order to obtain particulars concerning the man's medical history while in the service.

(*f*) If it is found that the disability from which the man is suffering is a result of war service he is then placed on pay and allowances exactly the same as he received when on active service, except that in lieu of Patriotic Fund allowances the Government pays a stated sum according to the size of the man's famliy. These allowances are continued as long as the man requires treatment which prevents him from following a gainful occupation.

(*g*) If a discharged soldier or sailor requires occasional treatment such as dressing of a wound, massage, removal of pieces of shrapnel, etc., which do not require him to stop his civilian occupation he may attend at the office of the Medical Officer according to direction and receive such treatment or medicine as he may require. An allowance of $1 for each such treatment may be granted providing the patient suffers a financial loss by such attendance.

(*h*) When a man considers himself to be a subject for Vocational re-education owing to his being unable to return to his previous occupation because of war disability he can apply to the District Vocational Officer in the locality in which he resides.

(*i*) If it is found by a Disabled Soldiers' Training Board that the man is eligible for re-training a report is forwarded to the Head Office of the Department at Ottawa and on the approval of the recommendation of the Disabled Soldiers' Training Board the man is granted a course of training and is placed on pay and allowances according to a scale set by the Department of Soldiers' Civil Re-Establishment.

(j) The entire organization for both treatment and training is carried out by the District Officials who make their reports monthly to the Head Office in Ottawa.

(*k*) In the case of a man who requires re-treatment if it is found that there are no medical documents available in the District a telegram is despatched by the District Medical Director to the Director of Medical Services at Ottawa and the documents are obtained from Militia Headquarters or from the Office of the Board of Pension Commissioners.

9. It is anticipated that all those who break down as a result of war service will be pensioners, though the pension will probably be less than that allowed for total disability. If a man is in Hospital, or is otherwise unable to follow a gainful occupation on account of the treatment he is receiving for a war disability, it is submitted that he should be paid allowances equal to those paid to other men who are receiving treatment, in the same hospital or in similar circumstances. In Canada a man undergoing treatment as an in-patient is paid the difference between the pension he is receiving and the amount he received while on active service, including allowances for his wife and family, as set forth in Clause 16 of the enclosed Order in Council. The Department would be prepared to pay any ex-members of the Australian Forces undergoing treatment the same rates, debiting the Australian Government with the amounts so paid. In order that ex-members of the Canadian Forces receiving treatment from the Australian Government may be put on a similar basis to ex-members of the Australian Forces it is submitted that it would be desirable for the Australian Government to follow the Canadian practice and to debit the Canadian Government with any amounts paid in this connection.

10. It is not probable that any ex-members of the Forces will require re-training owing to their being unable to follow their previous occupations because of war disability, but in the event of any such men presenting themselves for training, and it being deemed necessary to give training. It is suggested that pay and allowances authorized in Canada be paid to any ex-members of the Australian Forces, and the pay and allowances authorized in Australia to any ex-members of the Canadian Forces, when resident in the country of the other. The pay and allowances granted in Canada are set forth in Clauses 4 to 15 of the enclosed Order in Council. In fixing the amount to be paid it would be necessary to ascertain the pension a man is receiving and then to augment the amount to the re-training allowances.

SESSIONAL PAPER No. 14

11. As no medical documents will be available when a man presents himself for treatment or training the Department of Soldiers' Civil Re-Establishment will cable the Department to be indicated by the Government of Australia, using the Government Code, requesting authority for treatment or training which the Officers of the Department may deem necessary. Should, however, the man be in such a state of health as to require immediate treatment this will be given without waiting for authority. It is suggested that a similar course might be followed by the Government of Australia.

12. It is suggested that accounts be made up three-monthly, at the end of March, June, September and December.

13. The telegraphic address of the Department of Soldiers' Civil Re-Establishment is "MILHOSCOM, Ottawa".

14. On hearing from you that the proposals outlined in this letter, with such modifications as you may deem necessary, are acceptable to the Government of Australia, I will transmit them to the Honourable the Minister of Soldiers' Civil Re-Establishment for submission to His Excellency the Governor General in Council.

JULY 28, 1919.

To Lieut.-Genl. Baron Corvisart, Chief of the French Military Mission, French Embassy, Albert Gate, London, S.W.1.

I have the honour to acknowledge the receipt of your letter of the 16th inst., stating that you have forwarded my letter of the 14th inst. to the Ministry of War in Paris, drawing attention to the main principles and provisions of the scheme suggested and to the prime importance attaching to the solution of the problems therein discussed.

2. In order that you may be better able to advise the Ministry of War, I have the honour to furnish the following information.

3. The Department of Soldiers' Civil Re-Establishment has been empowered by the Government of Canada to give treatment and training to ex-members of the forces of any of His Majesty's Allies, and, with the approval of the Governor General in Council, to make arrangements with the Government of any of His Majesty's Allies for reciprocal treatment.

4. I enclose for your information copy of the Order in Council, P.C. 387, dated February 24th, 1919, and I would direct your attention especially to Clauses 1, 3 and 4.

5. It is anticipated that from time to time ex-members of the Canadian Forces may settle in France, and also that ex-members of the French Forces may settle in Canada. Further, there were a number of French reservists resident in Canada at the outbreak of war, who rejoined the French Colours. It is very desirable that each Government be empowered by the other to give to such men medical care and treatment should they suffer a recurrence of a war disability, and be unable to continue employment as a result of war service.

6. I am directed to propose that any ex-members of the Canadian or French Forces resident in the country of the other be granted by each Government treatment or vocational training, or the renewal of, or repairs to, artificial appliances, if the same are required as a result of war service.

7. It is not proposed that the Department of Soldiers' Civil Re-Establishment shall charge the Government of France any overhead expenses such as the salary or portion of the salary of its regular medical or vocational officers, as these officers would necessarily be employed whether ex-members of the French Forces received treatment or training or not. But in the treatment of individual cases where the department has no regular representative and local practitioners are employed on a schedule of pay according to the work done it would be necessary to make this a charge against the Government of France as it is made a special charge against this department. It is submitted that similar arrangements might be made by the Government of France.

8. With regard to the supply, renewals of, or repairs to artificial limbs, including minor orthopaedic appliances, it may be stated that the department has established an artificial limb factory in Toronto, with fitting depots in all the principal centres throughout Canada. The department will be prepared to treat ex-members of the French Forces requiring artificial appliances, or the repair of those which have already been supplied, at cost price, subject to similar arrangements being made by the Government of France.

9. The procedure in Canada is as follows:—

(*a*) The Country is divided into eleven Districts.

(*b*) At the Headquarters of each District there is a District Medical Director and Staff, a District Vocational Officer and Staff.

(*c*) The medical service is further sub-divided by the appointment of medical officers in each town of any size in each unit.

(*d*) When a discharged soldier or sailor falls ill he is directed by the Local Branch of the Returned Soldier Commission, or of the Great War Veterans or other Veterans' Association, to apply to the nearest medical officer of the Department of Soldiers' Civil Re-Establishment. If it is apparent that the man requires immediate treatment for what appears to be a war disability, the medical officer can give the treatment or order the man to hospital.

(*e*) Immediately a man reports to the local medical officer for treatment, that officer communicates with the District Medical Director in order to obtain particulars concerning the man's medical history while in the service.

(*f*) If it is found that the disability from which the man is suffering is a result of war service, he is then placed on pay and allowances exactly the same as he received when on active service, except that in lieu of Patriotic Fund allowances the Government pays a stated sum according to the size of the man's family. These allowances are continued as long as the man requires treatment which prevents him from following a gainful occupation.

(*g*) If a discharged soldier or sailor requires occasional treatment such as dressing of a wound, massage, removal of pieces of shrapnel, etc., which do not require him to stop his civilian occupation he may attend at the office of the Medical Officer according to direction and receive such treatment or medicine as he may require. An allowance of $1 for each such treatment may be granted providing the patient suffers a financial loss by such attendance.

(*h*) When a man considers himself to be a subject for vocational re-education owing to his being unable to return to his previous occupation because of war disability he can apply to the District Vocational Officer in the locality in which he resides.

(*i*) If it is found by a Disabled Soldiers' Training Board that the man is eligible for re-training a report is forwarded to the Head Office of the Department at Ottawa and on the approval of the recommendation of the Disabled Soldiers' Training Board the man is granted a course of training and is placed on pay and allowances according to a scale set by the Department of Soldiers' Civil Re-Establishment.

(*j*) The entire organization for both treatment and training is carried out by the District Officials, who make their reports monthly to the Head office in Ottawa.

(*k*) In the case of a man who requires re-treatment if it is found that there are no medical documents available in District a telegram is despatched by the District Medical Director to the Director of Medical Services at Ottawa and the documents are obtained from Militia Headquarters or from the Office of the Board of Pension Commissioners.

10. It is anticipated that most of those who break down as a result of war service will be pensioners, though the pension will probably be less than that allowed for total disability. If a man is in hospital, or is otherwise unable to follow a gainful occupation on account of the treatment he is receiving for a war disability, it is submitted that he should be paid allowances equal to those paid to other men who are receiving treatment in the same hospital or in similar circumstances. In Canada a man undergoing treatment as an in-patient is paid the difference between the pension he is receiving and the amount he received while on Active Service, including allowances for his wife and family, as set forth in Clause 16 of the enclosed Order in Council. The Department would be prepared to pay any ex-members of the French Forces undergoing treatment the same rates, debiting the French Government with the amounts so paid. In order that ex-members of the Canadian Forces receiving treatment from the French Government may be put on a similar basis to ex-members of the French Forces it is submitted that it would be desirable for the French Government to follow the Canadian practice and to debit the Canadian Government with any amounts paid in this connection.

11. It is submitted that in the event of any ex-members of the forces who may require re-training owing to their being unable to follow their previous occupations because of war disability presenting themselves for training, and it being deemed necessary to give training, the pay and allowances authorized in Canada be paid to any ex-members of the French Forces, and the pay and allowances authorized in France to any ex-members of the Canadian Forces, when resident in the country of the other. The pay and allowances granted in Canada are set forth in Clauses 4 to 15 of the enclosed Order in Council. In fixing the amount to be paid it would be necessary to ascertain the pension a man is receiving and then to augment the amount to the re-training allowances.

12. As no medical documents will be available when a man presents himself for treatment or training the Department of Soldiers' Civil Re-Establishment will communicate with the Consul-General, Montreal, requesting authority for treatment or training which the Officers of the Department may deem necessary. Should, however, the man be in such a state of health as to require immediate treatment this will be given without waiting for authority. It is suggested that a similar course might be followed by the Government of France.

13. It is suggested that accounts be made up three-monthly, at the end of March, June, September and December.

14. The telegraphic address of the Department of Soldiers' Civil Re-establishment is "Milhoscom, Ottawa."

15. On hearing from you that the proposals outlined in this letter, with such modification as you may deem necessary, are acceptable to the Government of France, I will transmit them to the Honourable the Minister of Soldiers' Civil Re-Establishment for submission to His Excellency the Governor General in Council.

Respectfully submitted

E. H. SCAMMELL.

SCHEDULE J.

Report on the Corps of Commissionaires and the Veterans' Corps.

In accordance with the letter of the Deputy Minister of the 2nd June, and with previous instructions received by me on the subject, I made an investigation into the work of the Corps of Commissionaires and another organization, run on somewhat similar lines, known as the Veterans' Corps, the head offices of which are situated in London. The object of this investigation was to ascertain how far it would be possible to operate a Corps of Commissionaires in Canada working independently or established under the direction and control of this Department.

CORPS OF COMMISSIONAIRES.

The Corps of Commissionaires was founded in 1859. Every man joining the Corps must be in good health, unless he has been wounded in war. He must deposit in the Savings Bank of the Corps £5 to £25 according to rank. There is an entrance fee of £2 10s. and a monthly payment of 10s. 3d. made up as follows:—

	s.	d.
Clothing	7	0
General Fund	1	9
Sick Fund	1	6
Total	10	3

There is no guaranteed employment to members of the Corps, though the majority obtain permanent work. The corps undertakes to provide men for all kinds of work, permanent and temporary. A fidelity guarantee is given to employers of from £25 to £50 but the employer must prosecute in case of defalcation. In case of sickness a substitute is provided.

Single men live in barracks, unless living with their employers, but messing there is optional. The cost of lodging is from 4s. to 4s. 6d. per week. The rates for messing are: for breakfast, 10d; dinner, 1s. 3d.; tea, 10d.; total, 2s. 11d. per diem. The weekly expenses for all corps payments, including 1s. to Savings Bank, 2s. for ordinary charges of all kinds are from 27s. to 30s including cost of messing and lodging, though the above prices are subject to alteration according to market rates.

The uniform and equipment of commissionaires is provided out of the Clothing Fund to which each man contributes 7s. per calendar month.

The sick and burial fund provides for a weekly allowance of 12s. for three months; 8s. for the next three months, and 6s. for the next six months.

If a commissionaire requires hospital care, the hospital charges are paid by the Corps.

A commissionaire is buried by the Corps, or a funeral allowance of £4 is granted if undertaken privately.

Every man of the Corps when joining, if a pensioner must deposit £5 in the Savings Bank; if a Reservist £5, if single, £25 if married. Interest is paid at the rate of 3 per cent.

From the 1st January to 30th May, 1919, over 3,000 applications for membership were made to the Corps of which scarcely 10 per cent were accepted and taken on.

The Corps itself is maintained by annual subscribers; by donations; (£10 for life governorship) and 10s. yearly by all employers.

VETERANS' CORPS.

The Veterans' Corps is an organization similar to the Corps of Commissionaires, but with less stringent rules. It is affiliated with the Veterans' Club. Enrolment costs five guineas, with an annual subscription of 5s.

Uniform, which is not compulsory but practically necessary, costs either £8 4s. 6d. (cloth) or £7 7s. (serge). In addition a deposit of £1 as a guarantee of good conduct and compliance with the rules of the Corps must be paid at the time of enrolment. This deposit, or the balance, if any deductions have been made from it, will be returned on a man's resignation or death.

The Veterans' Corps was founded in 1908. Doctor, dentist and solicitor are provided free. There is reduction made on the provision of artificial teeth. Cases of misconduct or defalcation come before the Committee. There has been no case for the past two years.

Before admission to membership careful inquiry is made into the character of the man. There is absolutely no guarantee of employment.

I discussed the suggestion, which has been made by various people in Canada that a Corps of Commissionaires should be formed in Canada with the son and successor of the founder, Major F. E. Walter, M.V.O., Commanding Officer, and Major J. H. Redstone, Assistant Adjutant of the Corps of Commissionaires, and Major Arthur Haggard, Chairman of the Veterans' Corps. I saw these three gentlemen separately but the opinions expressed were identical, that such an organization in Canada would be very unlikely to succeed. It was pointed out that failure would be assured if any Government Department undertook the supervision. The success of the two organizations in England has been largely due to the fact that they have been entirely free from Government supervision and control. It was further pointed out that the class of men suitable for enrolment, i.e., the old soldier, is not found to any extent in Canada. At the same time it was recommended that if the G.W.V.A. or the Army and Navy Veterans' Association desire to create an organization overlooking the management it might be a success in such centres as Montreal, Toronto, Winnipeg, or Vancouver.

Major Walter informed me that he had received numerous letters from various people in Canada, and that he had forwarded reports and particulars of the Corps of Commissionaires. Where his opinion had been asked he had stated definitely that he did not think an organization of this kind would be a success in Canada.

Respectfully submitted,

E. H. SCAMMELL.

APPENDIX II.

P.C. 2025.*

Acceptance and confirmation by the Privy Council of Canada of the arrangements made with the Imperial Authorities.

Certified Copy of a Report of the Committee of the Privy Council, approved by the Deputy Governor General on the 30th September, 1919.

The Committee of the Privy Council have had before them a report, dated 19th September, 1919, from the Minister of Soldiers' Civil Re-Establishment, submitting as follows:—

In May, 1919, Mr. E. H. Scammell, Assistant Deputy Minister of the Department of Soldiers' Civil Re-Establishment was instructed to proceed to England in order to discuss with the Imperial Authorities certain reciprocal arrangements for the treatment and training of ex-members of the Imperial Forces in Canada and of the Canadian Forces in the United Kingdom.

Mr. Scammell carried with him a letter of introduction from Your Excellency to the Right Honourable the Colonial Secretary. He was instructed that any agreements he might make would be subject to Your Excellency's approval.

Acting on this authority negotiations were entered into with the Right Honourable the Minister of Pensions and the Right Honourable the Minister of Labour, and the following proposals were submitted:—

(*a*) That the pensions of disabled ex-members of the Imperial Forces, who were resident in Canada or the United States of America at the outbreak of the late war, also the pensions of the children and other dependents of such men and the pensions of the widows of deceased ex-members of the Imperial Forces so resident, be augmented to the Canadian scale of pensions at the expense of the Imperial Government provided that such men, their dependents or widows still reside in Canada or the United States of America.

(*b*) That the Department of Soldiers' Civil Re-Establishment be authorized to grant treatment and vocational training to ex-members of Imperial Forces resident in Canada or the United States of America, and to pay such ex-members of the Imperial Forces while undergoing treatment or training and to their dependents the same allowances as are paid to ex-members of the Canadian Forces. These payments are to be made at the expense of the Imperial Government.

(*c*) That treatment and training be given by the British Ministry of Pensions and the British Ministry of Labour to ex-members of the Canadian Forces resident in the United Kingdom, and that allowances at British rates be granted during the period of treatment or training by the Imperial authorities at the expense of the Government of Canada.

(*d*) That with regard to the provision, renewal and repair of artificial limbs and appliances the Imperial Government should deal with ex-members

* Re-enacted by Order in Council P.C. 2324, dated 21st November, 1919, passed under authority of Soldiers' Civil Re-Establishment Act, 1919.

of the Canadian Forces in the United Kingdom at the expense of the Government of Canada, and the Government of Canada should deal with ex-members of the Imperial Forces resident in Canada and the United States of America at the expense of the Imperial Government.

In pursuance of these negotiations, on the 16th July, 1919, the War Cabinet reached the following decision:—

"(*a*) Pre-war British residents in Canada and the United States who enlisted in the Imperial Forces or Reservists who rejoined from these countries should be allowed the option of taking pensions and allowances and medical treatment and training, and all other privileges, at the same rates and on the same terms as are provided by Canadian Orders in Council, in place of the rates of pensions, etc., accorded under Royal Warrants.

"(*b*) The Canadian Pensions Administration (the Department of Soldiers' Civil Re-Establishment) be asked to undertake the investigation of claims to pension and the medical examination of disabled men in accordance with the principle and practices of Canadian Orders in Council relating to pensions, and to award pension on behalf of the British Government subject to confirmation by the Ministry of Pensions in each case. Provision for the necessary safeguards as to identification of beneficiaries required by the Appropriation Act; for the preservation of the responsibility of the Minister to Parliament; for the rendering of accounts by the Canadian authorities; and other details of the arrangement to be agreed with the Treasury.

"(*c*) Similar arrangements should be sanctioned with other self-governing Dominions."

The Minister recommends that the Department of Soldiers' Civil Re-Establishment be authorized to conclude and put into effect arrangements with the Ministries of Pensions and Labour regarding the treatment and training of ex-members of the Imperial Forces in Canada and the United States and the treatment and training of Canadian Forces in the United Kingdom, and that the Board of Pensions Commissioners for Canada be authorized to conclude and put into effect through the Minister of Soldiers' Civil Re-Establishment, arrangements with the Ministry of Pensions regarding payment of pensions to ex-members of the Imperial Forces and their dependents in Canada and the United States, in accordance with the decision of the War Cabinet dated the 16th July, 1919, and with the understanding reached by the Assistant Deputy Minister of the Department of Soldiers' Civil Re-Establishment with the two Ministries referred to.

The Committee concur in the foregoing recommendation, and submit the same for approval.

RODOLPHE BOUDREAU,

Clerk of the Privy Council.

APPENDIX III.

Schedule 1.—Circular issued by Ministry of Pensions after approval by the Privy Council of Canada and the Imperial Authorities of the Agreement between the Department of Soldiers' Civil Re-Establishment (Canada) and the Ministries of Pensions and Labour (England) as per Appendix 1.

Reg. No. M.S. 2 Gen 49. Circular 194

MINISTRY OF PENSIONS, SECRETARY'S OFFICE,
WESTMINSTER HOUSE, MILLBANK,
LONDON, S.W.1., 22nd October, 1919.

Provision of Medical Treatment, and Training (with or without concurrent Treatment) and Supply of Artificial Limbs and Appliances, etc., to men discharged from the Canadian Forces.

SIR,—I am directed by the Minister of Pensions to state, for the information of your committe, that he has arranged with the Canadian authorities that the provision made for necessary medical and surgical treatment or concurrent treatment and training, in the case of men discharged from the British Forces shall be extended to men discharged from the British Forces shall be extended to men discharged from the Canadian Forces who are residing in the United Kingdom. The arrangement also extends to the provision of spectacles, dentures and dental treatment, and of Artificial Limbs and Appliances including legs, arms, trusses, artificial eyes, orthopaedic boots, etc.

The Minister is confident that he may rely upon the co-operation and assistance of Local War Pension Committees in this connection, and I am accordingly to acquaint you with the procedure which it will be necessary to follow.

(1) When a man discharged from the Canadian Forces applies to a War Pensions Committee for the treatment or for the supply, repair, or renewal of an artificial limb or appliance, the Committee will follow the procedure prescribed in respect of a British pensioner (including reference to Medical Referee where necessary) up to the point at which they would ordinarily take steps for the actual provision of the treatment or the supply or repair of the appliance or his admission to a hospital or limb-fitting centre for this purpose. At this stage they will report the case to the Board of Pensions Commissioners for Canada, 103, Oxford Street, London, W. 1, forwarding a copy of the medical certificate, if any. The Board will then advise the Committee whether the man is eligible under Canadian regulations. If he is, the Committee will arrange for what is required on the same lines as if the man were a British pensioner. *In any case, however, in which the provision of treatment is deemed to be urgent*, the War Pensions Committee should act upon the Medical certificate forthwith, and at the same time notify the Board of Pensions Commissioners that they have done so and await the Board's further instructions. Where treatment or the supply, repair or renewal of an appliance is not recommended the Local Committee should also report the fact to the Board of Pension Commissioners. When a man is supplied with spectacles or glass eyes, or is sent to a special Aural Board for examination, the case should be reported to the Ministry of Pensions (Appliance Branch).

(2) In advising the Committee of the man's eligibility, the Board of Pension Commissioners will also furnish particulars regarding the man's pension, *the pay-*

ment of which will continue to be made to him direct by the Board while he is under treatment. The Board will also supply particulars of the man's dependants. If the man, while under treatment, or while awaiting institutional treatment, is unable to work at a remunerative occupation and his pension is less than the total amount which would be payable to him and his family by way of treatment allowances under the Royal Warrant, the Committee should *supplement* the payment to the man so as to bring it up to the equivalent of full treatment allowances.

In any case in which the War Pensions Committee is advised by the Board of Pension Commissioners that a man is still in receipt of Army pay and allowances the Committee should arrange for the provision of necessary treatment but should not supplement the payment to or in respect of the man or his family.

(3) In any case in which the man is able to work while under treatment or while awaiting the supply, repair or renewal of a limb or appliance, he may be compensated for loss of remunerative time in the same manner as a British pensioner.

(4) When the medical certificate contains a recommendation that General Practitioner Treatment should be provided, the Committee should ascertain whether the man is eligible for this form of treatment under the National Insurance Acts. In any case in which the Committee is advised by the Insurance Committee that the man is not so eligible they should make arrangements with a Local Practitioner for this form of treatment to be provided and satisfy themselves that the charges are reasonable.

(5) In cases of tuberculosis if the man is ineligible for Sanatorium Benefit by reason of not being insured, the War Pensions Committee should request the Insurance Committee to make arrangements for the provision of the necessary treatment on behalf of, and at the cost of, the War Pensions Committee, subject to recovery as provided in paragraph 6.

(6) When treatment, or the supply, repair, or renewal of a limb or appliance has been arranged, the Committee should forward to the Board of Pension Commissioners a statement showing the payment (if any) which will be made by them, and stating also the charges being incurred in respect of the cost of treatment, etc. When treatment terminates, or the limb or appliance has been supplied or repaired, the Committee should likewise inform the Board. (In the case of treatment the notification should be on forms M.S.D. 6 and M.S.D. 7, suitably adapted.) The Board will then re-imburse the Committee the whole of the expenditure incurred by them on the man's account. The cost of artificial limbs, mechanical chairs, etc., ordered and paid for otherwise than by the War Pensions Committees should not be included in the accounts submitted by them to the Board; such expenses will be recovered by the Ministry direct from the Board. This also applies as regards spectacles and glass eyes.

(7) The foregoing arrangements for treatment apply also to concurrent treatment and training, which should be provided in accordance with the procedure outlined in the neostyled circular of the 21st August, 1919, or any modification thereof. Industrial or agricultural training will be provided on similar lines by the Ministry of Labour. Applicants whose cases have been investigated under Circular 71 or the neostyled circular dated June, 1919 (registered number 5188) should, if eligible under those circulars, be referred to the Divisional Director of Industrial Training or the County Agricultural Executive Committee in accordance with the arrangements shown in the above-mentioned circular of the 21st August, 1919. Particulars of the payments they are receiving from the Board of Pension Commissioners for Canada should be furnished, and the Local Committee should not pay any allowances to them.

(8) In any case in which it is brought to the notice of the War Pensions Committee that a man discharged from the Canadian Forces has been certified to be insane, they should communicate with the Board of Pension Commissioners, furnishing all particulars available.

(9) Any case of refusal of treatment should be reported by the Committee to the Board of Pension Commissioners, explaining the action taken by the Committee with a view to persuading the man to accept, and stating the reasons given by the man for refusal. The Board of Pensions Commissioners will advise the War Pensions Committee of any action they desire taken in the matter.

(10) The death of a man discharged from the Canadian Forces, if it comes under the notice of the Local Committee, should be reported to the Board of Pensions Commissioners who will take whatever further action is appropriate to provide for the payment (if authorized by Canadian Regulations) of any funeral expenses.

I am, Sir,

Your obedient servant,

GEORGE CRYSTAL,
Secretary.

The Secretary,
Local War Pensions Committee.

Schedule 2. Printed Circular No. 71, dated April, 1919, Neostyled Circular No. 5188, dated June, 1919, and Neostyled Circular of the 21st August, 1919, referred to in Paragraph 7 of the foregoing Circular No 194.

MINISTRY OF PENSIONS,

SECRETARY'S OFFICE, Westminster House, Millbank, S.W.1., April, 1918.

TRAINING OF CANADIAN SOLDIERS DISCHARGED IN ENGLAND.

SIR,—I am directed by the Minister of Pensions to inform you that it has been decided, with the consent of the Lords Commissioners of H. M. Treasury, to extend the privilege of training provided under Article 6 of the Royal Warrant to disabled soldiers of the Overseas Military Forces of Canada who are recommended by the Canadian Pensions and Claims Board for discharge in England on the ground that they have homes and relatives in the United Kingdom, or other adequate reasons for remaining in this country after discharge and are not likely to become chargeable to public funds as paupers.

Arrangements have been made whereby the London War Pensions Committee will investigate and report to the Minister of Pensions on the case of each disabled Canadian soldier whom the Canadian Pensions and Claims Board propose to discharge in this country. If, on receipt of the committee's recommendations, the minister considers that the man may properly be accepted for training at the expense of the ministry, he will notify the Canadian Pensions and Claims Board accordingly, in order that the man may receive his final discharge in England. The case will then be referred to the Local War Pensions Committee for the area in which the man intends to reside in this country, and they should arrange for his training in accordance with the procedure regularly adopted in the case of disabled sailors and soldiers of the British Imperial Forces. The question of eligibility for assistance will not arise in these cases and Local Committees should not arrange for the training of any disabled Canadian soldier whose case is not notified to them in the manner above indicated.

A Canadian soldier who is admitted to training will be entitled to the same benefits as those provided for discharged men of the Imperial Forces who receive training under the Royal Warrant, but the procedure of payment will be different. The man's pension will continue to be paid by the Canadian authorities and will not be suspended during the period of instruction; the Local Committee who arrange the training will instead pay the man a weekly allowance which, together with his pension,

will amount to the allowance to which a disabled man of corresponding rank in the Imperial Forces would be entitled under Instruction 34 during training. This weekly allowance will, in the ordinary way, be subject to reduction by the amount of any wages which the man may earn during his course of training.

I am, Sir, your obedient servant,

MATTHEW NATHAN,
Secretary.

The Secretary, Local War Pensions Committee.

MINISTRY OF PENSIONS,

SECRETARY'S OFFICE, Westminster House, Millbank, London, S.W. 1, June, 1919.

Ref. No. 5188.

TRAINING OF CANADIAN SOLDIERS DISCHARGED IN ENGLAND.

SIR,—I am directed by the Minister of Pensions to refer to Circular 71, which authorizes the provision of vocational training for disabled Canadian soldiers who are recommended by the Canadian Pensions and Claims Board for discharge in this country.

I am to inform you that it has been decided that Canadian soldiers who were discharged in England prior to the issue of that circular may also be given training under the Royal Warrant. In their cases, however, the usual procedure, whereby the London War Pensions Committee investigate and report to the minister, will not be practicable except for men resident in the area if that Committee. Where a man is resident in another area and desires training, he will be asked by the Board of Pension Commissioners for Canada to fill up Form T.R. (Canada) and return it to that department. The particulars as to amount of pension, disability, etc., will be completed and the form returned to the man with the request that he apply to his Local War Pensions Committee. The Local War Pensions Committee should then satisfy themselves according to the usual procedure (including reference to the Medical Referee) that the applicant fulfils the ordinary conditions of eligibility for training under the warrant, and when so satisfied should make arrangements for his training in the usual way. Maintenance allowances during training so arranged should be paid in accordance with the procedure outlined in the last paragraph of Circular 71.

Where training is arranged for Canadian soldiers discharged prior to the issue of Circular 71 it is requested that local committees notify the Board of Pension Commissioners for Canada, British Branch, 103, Oxford Street, W.1, of the dates of the commencement and termination of the training.

MINISTRY OF PENSIONS, WESTMINSTER HOUSE,

F. WILKINSON,
Advisor on Training.

The Secretary, Local War Pensions Committee.

16675.

SESSIONAL PAPER No. 14

ADVANCE CIRCULAR,

MINISTRY OF PENSIONS, WESTMINSTER HOUSE,

MILLBANK, S.W.1, August 21, 1919.

TRAINING (WITH OR WITHOUT CONCURRENT TREATMENT.)

SIR,—I am directed by the Minister of Pensions to advert to the circular of July 24, 1919, regarding the transfer of the training of disabled men to the Ministry of Labour.

As was explained in the Circular (No. 15168) of February 20, 1919, on the same subject, it has been decided that while disabled men who are capable of training under normal conditions will be dealt with by the Ministry of Labour, there will be reserved to the Ministry of Pensions all cases in which the man's condition makes treatment still a primary consideration, and where such treatment as is required would interfere unduly with the man's training.

Discrimination between those cases which will be referred to the Ministry of Labour and those, on the other hand, which will be dealt with by the Ministry of Pensions, will be the duty of the Medical Referee, and the necessary instructions have been given to him as to the certificate to be supplied.

For the information of your committee, the following particulars are given as to the two classes of cases:—

MINISTRY OF PENSIONS CASES.

Disabled men of the following classes will be dealt with by the Ministry of Pensions:—

(1) Men requiring treatment such as would interfere with regular attendance at a continuous course of training on ordinary industrial lines;

(2) Men who are likely to break down or have broken down in training or employment under ordinary industrial conditions;

(3) Men whose concurrent treatment and training necessitates that they reside in a convalescent centre; and

(4) Men whose disability is such as to make it impossible or undesirable for them to be trained or employed in association with ordinary workmen, e.g. cases of severe facial injury, epilepsy, blindness or deafness.

MINISTRY OF LABOUR CASES.

Cases which will be dealt with by the Ministry of Labour are:—

(1) Men who require no further medical treatment or supervision, and can, so far as their health is concerned, be absorbed in training or employment under ordinary industrial conditions; and

(2) Men who can only require occasional treatment which will not interfere unduly with regular attendance at a course of industrial training.

The occasional medical treatment will be provided by the Ministry of Pensions. The Ministry of Labour will endeavour to secure that trainees who are found to require treatment shall take such treatment. The necessary arrangements for enabling the man to receive the treatment which he requires will be made by the Local War Pensions Committee in the ordinary way. The Ministry of Labour will continue payment of training allowances to men who receive treatment while continuing to undergo training, and treatment allowances will therefore not be payable.

Cases of men who break down during the course of training under the Ministry of Labour will be notified by the Divisional Director of Training to the Local War Pensions Committee, and leave of absence from the course of training will be given to such men to undertake whatever treatment is necessary in accordance with the recommendation of the Medical Referee. If, however, the Medical Referee finds that treatment in such cases will last longer than three weeks the Local Committee should notify the Divisional Director of Training who will then suspend payment of training allowances and transfer the case to the Committee, which will thereafter provide whatever treatment is necessary and pay the allowances due under the Royal Warrant.

PROCEDURE FOR DETERMINING CASES.

The Local War Pension Committee will be responsible for ascertaining whether a disabled man is eligible and suitable for (*a*) training under ordinary industrial conditions or (*b*) concurrent treatment and training. For this purpose they will refer the man to the Medical Referee who will examine and classify him in accordance with instructions which have been sent to him, and will furnish the Local Committee with a certificate on form M.R. 3A. in duplicate. This form—of which specimens are enclosed and prints will be supplied as early as possible—supersedes and renders obsolete form M.R.3 and the usual fee of 5/- will be payable for a certificate thereon.

The conditions which qualify a man for concurrent treatment and training or for training under ordinary industrial conditions are set out under those respective headings below.

It is to be pointed out that under existing arrangements the provision of training, which cannot safely be dissociated from treatment, of discharged tuberculous men is a matter for the Ministry of Health, the department at present responsible for the treatment of such cases.

ARRANGEMENTS FOR CONCURRENT TREATMENT AND TRAINING.

Eligibility for admission to courses of concurrent treatment and training will be limited to men suffering from a disability attributable to or aggravated by service, who are found by the Medical Referee to be either unfit to follow their pre-war occupations or unable to follow them without diminution of earning capacity.

Men with non-attributable disabilities are not eligible, and in such cases clause (*c*) of the medical certificate (form M.R. 3a) should be struck out before the form is sent to the Medical Referee.

Cases which the Medical Referee finds should be given a course of concurrent treatment and training under the Ministry of Pensions will be provided for in the following ways:—

(1) Military orthopædic hospitals are now being transferred from the War Office to the Ministry of Pensions. These hospitals are equipped with a limited number of workshops in which elementary training of various kinds is given to all cases susceptible of training. As soon, however, as the man's condition permits he will be evacuated, and according as his case requires will be transferred either to a course of training under the Minister of Labour with such occasional treatment as is alone necessary or to one of the convalescent centres under the Ministry of Pensions.

(2) Convalescent centres are being set up by the Ministry of Pensions in various parts of the Kingdom for all cases in which the man's condition requires that he should reside in an institution where he may undergo treatment and training concurrently under medical supervision. A centre capable of accommodating 600 men with

a possibility of considerable expansion will be opened very shortly at Blackpool and further centres are approaching completion. The dates of opening will be notified from time to time to Local Committees.

The Ministry will make such arrangements at the centres as will secure that the man's surroundings shall be as agreeable and home-like as possible. The living arrangements will be based on the most up-to-date experience of communal living. The individual will be interfered with as little as possible and his amusement and entertainment will be catered for.

During his stay in a centre, a man will be given such a thorough grounding in the technique of a new occupation as will fit him for learning it thoroughly with the Ministry of Labour when he no longer requires treatment. The training gained at the centre will be of such a nature that the value of the man as a wage-earner should be materially increased, even though he should not eventually take up that occupation. In other cases the man may learn the technique of an occupation in which he can become a wage-earner very shortly after he leaves the centre and in which he may earn more than an unskilled man in a better known trade.

This instruction will take place at one of these centres during the time in which the man is being treated for his disability. The amount of training for which a man is capable will be regulated in accordance with his physical ability and this will be decided by the Medical Specialist. In no case will training be carried out at the expense of treatment.

TRAINING FACILITIES IN CONVALESCENT CENTRES.

Training in the new occupations at the centres will be in the care of expert instructors who will be under the immediate supervision of a competent and experienced principal. The latest and most up-to-date methods of instruction will be followed and illustrations directly bearing upon the main industries will be graphically and scientifically given. It is intended to make the instruction from beginning to end practical, recreational, educational, and no pains will be spared to make the teaching as attractive as possible. With this object the workshops will be provided with up-to-date machinery and scientific apparatus. Experience has shown that training given in the methods which will be followed has always excited interest, and the men have made rapid progress when they themselves have conducted their own experiments and carefully noted and measured their results. A list of the occupations or professions in which training may be provided at the centres and notes thereon follow.

Preliminary courses of instruction will be arranged in the principles underlying mechanical and electrical engineering. These will enable men who have some knowledge of the various branches of these industries to qualify for more important positions in which a knowledge of scientific and technical principles is involved. Men will be specially trained as draughtsmen, electrical assistants, electrical attendants (e.g., in private mansions, workshops, and hotels), instrument makers, and electrical storemen. In the various woodwork shops men will be so trained as to enable them to become eligible for openings in factories, workshops, etc., where a knowledge of carpentry as applied to building is required. Instruction will also be given to men desirous of becoming qualified in the various sections of the furniture trades, e.g., cabinet and chairmaking, upholstery, carving and furniture design. A special course will be organized for men who desire to be trained as instructors of manual work and arrangements have been made for the men who pass the necessary examinations to have a diploma entitling them to teach.

The instruction given in the physical and chemical laboratories will be such as to qualify men for the more routine work of industrial chemistry. Special rooms will be fitted up for training men as dispensors, sanitary inspectors and photographers.

The workshops will also be equipped for the training of men for the leather goods trade; in the cutting and polishing of precious stones, and as designers in jewellery and stained glass work.

Men will also be trained in watch and clockmaking and repairing, and in the manufacture of mechanical models and toys.

For men desirous of taking up outdoor work instruction will be provided in horticulture, market gardening and poultry farming.

ALLOWANCES DURING CONCURRENT TREATMENT AND TRAINING.

The allowances payable while a man is undergoing a course of concurrent treatment and training will be the same as those granted in cases where treatment only is given. The instructions with regard to treatment allowances should therefore be followed. Any alterations consequent on the proposed new scales will be notified in due course.

The usual notifications of the commencement and termination of a course of concurrent treatment and training should be sent to the Pension Issue Office. Forms M.S.D. 6 and M.S.D. 7 should be used for this purpose. The termination and result of a course will be notified to a local committee by the superintendent of the centre on form T.R. 2B, adapted where necessary.

ARRANGEMENTS FOR TRAINING UNDER ORDINARY INDUSTRIAL CONDITIONS, ETC.

The Ministry of Labour are empowered to provide training under ordinary industrial conditions, not only for disabled men qualified under the Royal Warrant as suffering from a disability attributable to or aggravated by service, but also for men discharged with a non-attributable disability, provided in each case that the man is medically certified to be (1) fit for the course proposed, and (2) either unfit to follow his pre-war occupation or unable to follow it without diminution of earning capacity.

The formal responsibilities therefore of the local committee in regard to the industrial training of disabled men are now limited to the following functions:—

(*a*) Ascertaining whether the medical conditions which render a man eligible for training are fulfilled, and supplying the Divisional Director of the Ministry of Labour (or in the case of Agricultural training, as defined below, the County Agricultural Executive Committee) with information on this point, including a copy of the Medical Referee's Certificate.

(*b*) Passing candidates forward to the local representative of the Ministry of Labour (or to the County Agricultural Executive Committee) and

(*c*) Supplying the local representative of the Ministry of Labour (or County Agricultural Executive Committee) with any information required in respect of men whom the Committee has placed in training prior to the transfer of responsibility.

The local committee will not be responsible for the payment of the man's travelling expenses after he has been referred to the Ministry of Labour or Board of Agriculture.

It is, moreover, for the Divisional Director of Industrial Training to advise individual men as to the course of training which they could suitably undertake.

The arrangements for interviewing and selecting candidates for training vary in the different areas, and the precise arrangements to be made by your Committee for sending forward disabled men who desire and are eligible for training should be ascertained from the Divisional Director of the Ministry of Labour.]

Certain kinds of training are, however, provided, not by him but by the representatives of other departments:—

(1) *Agricultural Training.*—The Board of Agriculture and Fisheries in England and Wales and the Board of Agriculture, Scotland, are responsible for providing

training in agriculture, including dairying, horticulture, market gardening, poultry farming, bee-keeping and tractor-driving, but not training in agricultural machinery, blacksmiths' work, harness-making, wheelwrights' work or vehicle-making. Disabled men in England, Wales and Scotland who desire training in agricultural industries should be referred to the Secretary of their County Agricultural Executive Committee. These committees are usually located in the county town, but the Middlesex Agricultural Executive Committee *(which serves the county of London also)* sits at The Guildhall, Westminster, S.W. 1. In any other case of doubt, the address can be obtained from the nearest employment exchange.

(2) *Professional Training.* Training of ex-service men for the professions (e.g. solicitor, accountant, veterinary surgeon, etc.) and for posts of a managerial or consultative character in industry and commerce, is dealt with by the Appointments Department of the Ministry of Labour, and candidates of suitable educational attainments should be referred to the District Director of the Appointments Department.[1] A list of District Directors is attached. Training in ordinary commercial subjects, e.g. shorthand, book-keeping, etc., is dealt with by the Ministry of Labour (Divisional Director of Training) under the general scheme.

ALLOWANCES DURING TRAINING UNDER ORDINARY INDUSTRIAL (OR AGRICULTURAL) CONDITIONS.

The Committee are aware that as from the end of July, the Ministry of Labour took over the payment of allowances to men undergoing industrial training and introduced a new scale as an alternative to the Warrant Scale. The Government have under consideration a scale intended to supersede both. It is proposed that this scale shall come into operation as from the first pay-day after the 1st September, 1919, and particulars will be communicated to your Committee as soon as possible.

ALLOWANCES DURING PROFESSIONAL TRAINING.

In so far as this training is carried out at universities and places of higher education, the scheme of grants is administered by the Board of Education or the Scottish Education Department in conjunction with the Appointments Department of the Ministry of Labour, but, whichever the controlling authority, the financial assistance given will be based upon a scheme which takes into consideration the individual circumstances of each case. For further particulars reference should be made to the District Director of the Appointments Department.

I am, sir,

Your obedient servant,

GEORGE CHRYSTAL,
Secretary.

The Secretary,
Local War Pensions Committee.

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[1] The addresses appended to the circular of the 24th ultimo require alteration as follows:—
Midlands—Mr. Alderman James, 75, New Street, Birmingham.
South Western—Mr. W. Pullinger, 39, Roundstone Street, Trowbridge.
South Western—Mr. S. C. Dunn, 10, The Crescent, Plymouth.
Ireland—Col. Crozier, 65, Merrion Square, Dublin.

[2] Applicants for training in forestry should be referred to the divisional director, but there are at present very few vacancies for disabled men in forestry.

APPENDIX.

APPOINTMENTS DEPARTMENT.

District Directorates.

Head Office and Address.	*Counties included.*
PERTH—	
Queen's Hotel, Leonard Street	Perth, Inverness, Argyll, Aberdeen, Forfar, Elgin, Fife, Clackmannan, Kincardine, Ross and Cromarty, Caithness, Nairn, Banff, Kinross, Stirling, The Isles.
EDINBURGH—	
Balmoral Hotel, Princess Street	Linlithgow, Haddington, Roxbrough, Kirkcudbright, Wigtown, Lanark (with all Glasgow area), Selkirk, Edinburgh, Berwick, Dumfries, Dumbarton, Ayr, Renfrew, Peebles.
MANCHESTER—	
4, Cathedral Gates	Cumberland, Westmorland, Lancashire, Isle of Man, Cheshire.
CARDIFF—	
Springfield House, Queen Street	Denbigh, Merioneth, Montgomery, Cardigan, Monmouth, Anglesey, Carmarthen, Carnarvon, Flint, Brecknock, Radnor, Glamorgan, Pembroke.
LEEDS—	
Hotel de Ville	Northumberland, Durham, N. Riding, E. Riding and W. Riding (Yorks).
NOTTINGHAM—	
Lecture Hall, Castle Gate	Derby, Nottingham, Leicester, Lincoln, Rutland.
BIRMINGHAM—	
111, New Street	Worcester, Gloucester, Oxford, Hereford, Salop, Warwick, Buckingham, Berks, Stafford.
EXETER—	
2 and 3, Higher Summerlands	Cornwall, Somerset, Hants, Devon, Wilts, Dorset.
CAMBRIDGE—	
16, Hills Road	Norfolk, Northampton, Huntingdon, Hertford, Suffolk, Cambridge, Bedford, Essex.
LONDON—	
Horrex's Hotel, Strand, W.C.	London, Surrey, Sussex, Middlesex, Kent, Aldershot Command.
DUBLIN—	
64 and 65, Merrion Square	All Ireland except Ulster.
BELFAST—	
Grand Central Hotel, Royal Avenue	Ulster.

Schedule 3. Letter from the Ministry of Labour (Training Department), and Memorandum No. 46 regarding the Training in the United Kingdom of Disabled ex-Members of the Canadian Forces, dated the 11th November, 1919, referred to therein.

MINISTRY OF LABOUR,

Training Department, St. Ermin's Hotel, Westminster,

LONDON, S.W.1, 10th November, 1919.

SIR,—I am directed by the Minister of Labour to refer to conferences which took place in July and August last between officers of this department and the assistant deputy minister of the Department of Soldiers' Civil Re-Establishment regarding the reciprocal arrangements to be made with the Canadian Government for the training of disabled ex-service men, and to say, for the information of Mr. Scammell, that the

following authority has now been conveyed to Sir Robert Horne by the Lords Commisssioners of H. M. Treasury:—

(*a*) To make payment to the Canadian Government of sums expended by them in connection with the training in Canada of pre-war British residents in Canada and the U.S.A., who enlisted in the Imperial Forces or Reservists who rejoined from those countries, the payments to be made in such cases to be on the same scale as those paid to other persons similarly trained by the Canadian Government; the cost of the training to be recovered from the Imperial Government.

(*b*) To train, on behalf of the Canadian Government, discharged and disabled soldiers from the Canadian Forces resident in the United Kingdom, the payments to be made in such cases to be on the same scale as those paid to other persons similarly trained by the Minister of Labour, the cost of the training to be recovered from the Canadian Government.

I am to say that arrangements were made in September last for the necessary procedure to be instituted whereby the agreement made with the Canadian Government in this matter might become effective. I enclose herewith, for the information of Mr. Seammell, a copy of Memorandum No. 46, issued to all divisional directors of industrial training, on the subject, on the 11th September.

I am, Sir, your obedient servant,

(Sgd.) F. O. MANN.

The Assistant Deputy Minister,
Department of Soldiers' Civil Re-Establishment,
Ottawa.

Memorandum No. 46.

MINISTRY OF LABOUR.

TRAINING DEPARTMENT.

To Divisional Directors of Industrial Training—Disabled Canadian Soldiers:

1. Under arrangements made with the Canadian Government for the reciprocal treatment of ex-members of the Canadian or the Imperial Forces, either in this country or in Canada and the U.S.A., Divisional Directors may deal with cases of discharged and disabled Canadian soldiers who apply for training on the same lines as those of the Imperial Forces, subject to the following procedure:—

2. Arrangements have been made whereby Local War Pensions Committees will investigate the cases of Canadian soldiers who have been approved for training by the Ministry of Pensions in order to certify to the Divisional Director (1) that the man in question was suffering from a disability at the date of his discharge which prevents him from following his pre-war occupation, and (2) the amount of the disability pension which is paid to the man by the Canadian authorities. Where a Canadian soldier applies direct to a Divisional Director for training, his case should be referred to the Local War Pensions Committee for information on these points. Cases (if any) of Canadian soldiers already in training should also be referred to the Local War Pensions Committee for this information.

3. As no machinery exists for stopping the pensions of disabled Canadians who undergo a course of training in this country, it will be necessary for the Divisional Director in authorizing payment, to deduct from the net allowance ordinarily payable

the total amount of disability pension which the man is receiving from the Canadian authorities, so that in respect of total receipt from both sources the man will be placed in exactly the same position as a soldier of similar rank in the Imperial Forces whilst in training.

4. The amount expended in respect of the training of each Canadian is recoverable from the Canadian authorities. It will therefore be necessary for the papers of Canadians accepted for training to be clearly endorsed at the top CANADIAN, so that each case can be traced without difficulty. Care must be taken to see that the copy of the authorization M.L.T. 21 sent to the local accountant is clearly marked in this way.

5. These instructions only apply to disabled Canadian soldiers. Fit demobilized Canadian soldiers are not entitled to training.

J. A. BARLOW.

11-9-19.

APPENDIX IV.

Report submitted to the Honourable the Minister of Soldiers' Civil Re-Establishment by Walter E. Segsworth, M.E., lately Director Vocational Training for the Department, and T. A. Stevenson, Representative of the Trades and Labour Congress of Canada, attached to the Department, dealing with methods adopted in Great Britain for the Vocational Retraining of ex-members of the British Forces disabled by War Service, and the relations existing between organized labour and such trainees and the British Government.

OTTAWA, August 31, 1919.

The Honourable Sir JAMES A. LOUGHEED, K.C.M.G., P.C.,
Minister, Department of Soldiers' Civil Re-Establishment,
Ottawa, Canada.

Dear Sir JAMES,—Certain comparisons have been drawn by returned soldiers and others between the training said to be given ex-service men in the United Kingdom and in Canada. It has been claimed that the United Kingdom has a superior system of training, especially in the so-called apprenticeship schemes. It was also asserted that greater co-operation existed between organized labour and the Government agencies administering training, and that Canada should in part, adopt their system. In view of this it was felt that an investigation of the English system should be made in order to ascertain if anything could be found which if adopted could improve the Canadian work. An inter-allied council on the treatment and training of men disabled in war was called to meet in Rome on May 15, 1919, and it was felt that Canada should be represented. Accordingly we proceeded to England and arrived there on the 10th May, and finding that the Inter-Allied Conference in Rome was indefinitely postponed, we proceeded to investigate the training of returned soldiers in Great Britain, paying particular attention to the attitude of organized labour toward such training, and the operation of the so-called apprenticeship system for training disabled men.

We completed our investigations toward the end of July and no definite date having been set for the Inter-Allied Conference in Rome, we returned to Canada on the *Lapland*, leaving England August 1.

We beg to submit the following report of our investigations in the British Isles:—

We arrived at the following general conclusions:—

That the number being given training in Great Britain was hopelessly inadequate to take care of the needs of the situation. At the end of April there were approximately 15,000 disabled ex-members of the Imperial Forces who were trained or receiving training. At that time Canada had 11,615 men trained or in training. The casualties in the Imperial army were at least ten times those in the Canadian Forces, and to equal the Canadian work in volume they should have had at least 116,000 men trained or in training on May 1, 1919.

We found that the announced programme of the British Government providing for the training of a wider class of men than in Canada was not being carried out. Comparisons cannot rightly be drawn on what is offered, but must be based on the amount and quality of the work actually being done. Measured on this basis, Great Britain is far behind Canada. Large numbers of disabled men have been accepted for training and cannot commence because facilities have not been provided. In the London area alone 2,700 have been passed for training, but are still waiting.

In Birmingham, which included the Midland district, with a population of over four million, there are only 2,000 men in training. In Edinburgh we found only 169 men trained or in training, with 66 waiting training. In Glasgow there were 482 trained or in training, with a waiting list of 18.

In Great Britain very few special schools (apart from those existing before the war) have been established, while in Canada no men who have been accepted are awaiting training, as many new institutions have been provided to meet the needs of this work. Among those schools which existed in Great Britain before the war there are a few trade schools which have been established for some years which are peculiarly adapted to the training of disabled men. However, outside of these few institutions the training is no better than it is in Canada and in some places it is of a much lower grade.

The quality of the training given in Great Britain is marked by a lack of uniformity. This is largely due to the fact that there is very little control either by inspiration or direction from the central authority in London, and also to its administration by voluntary committees.

The British authorities have not succeeded in obtaining the same degree of co-operation with organized labour as exists in Canada. This, we believe, is largely due to the fact that there is no one authority representing organized labour to deal with this matter, and also to the fact that in assigning men to courses of training the local committees do not adhere to the policy of training men in an occupation closely related to the one followed before the war. Former electrical workers may be trained as carpenters, former miners may be trained in the building trades. A machinist was given a course as a plumber, and men with all sorts of pre-war occupations are being trained as machinists or engineers.

The system of apprenticing disabled men in industry as worked out and published by the Ministry of Pensions in a series called "Opening in Industry" has proved cumbersome in operation, and is being discarded by the Ministry of Labour, which is taking over the training of disabled men from the Ministry of Pensions. The proportion of men being trained in industry in England is not as high as it is in Canada.

Further, the system which exists of only training men in what are called approved occupations results in the great majority of the men being trained in about 40 trades, while in Canada over 350 occupations are available. It naturally follows that these 40 occupations are being more or less crowded and the labour unions are becoming restless for fear these trades may be diluted. At the end of July satisfactory co-operation in regard to training had not been attained in a number of industries, outstanding examples being the cotton industry, the electrical trades, the engineering trades and the railroad trades.

The relations between organized labour and the training authorities is not as satisfactory in general as it is in Canada. This is due to the small number of occupations available for training disabled men, causing dilution of labour in those trades in which training is permitted, and to training ex-service men in occupations which have no relation to those they followed before the war.

We found that the length of training on full pay and allowances in Great Britain is on the average no longer than in Canada, and perhaps shorter, although it was impossible to get any accurate statistics on this point.

We failed to find in great Britain any follow-up system to take care of the graduates. No statistics existed as to the number of graduates placed in employment, or their whereabouts, or the wages they were being paid. It is therefore impossible to form any conclusion about the actual results of the training system as measured by numbers of graduates stabilized in employment, or the comparative wages they were receiving.

In Canada a very comprehensive system has been developed for placing the graduates of training courses in employment suited to their disability and even after

placement they are kept track of for some time in order to be sure that they are stabilized in civil life, to obtain statistics as to the percentage of successful graduates, and as to their comparative wages before the war and after training. These statistics are used to improve the Canadian system from time to time.

The underlying causes for these conditions in Great Britain are, we believe, as follows:—

1. The failure to establish a direct and personal chain of responsibility throughout the system.

2. The fact that locally the work is controlled by voluntary committees, the members of which are interested in many other activities.

3. The lack of industrial experience of the executive members of the various staffs. In Canada practically all the executive officers of the training department are returned men, who, prior to the war had industrial experience.

4. The separation of different branches of training under different authorities.

The foregoing conclusions were the result of interviews we had with a great number of officials in England. Most of our work was done in the London area, but we visited Aberdeen, Edinburgh, Glasgow, Loughborough, Birmingham, Brighton, Bristol and Southport. Actual statistics were difficult to obtain and in a great many cases did not exist. Visits were made to numerous technical schools and training institutions and your representatives were accorded the privilege of sitting on various committees and being present when ex-soldiers were being interviewed. Every facility was placed at our disposal for obtaining information.

In order to understand the conclusions arrived at it is desirable that a general description of the work be given.

During the war the Ministry of Pensions found it necessary to train a large number of civilians for munition work, principally as special operators in machine shops and in aeroplane work. While the war was in progress, training of any sort looking towards peace conditions was not encouraged. Labour of any kind was so much in demand that even men severely crippled, provided they had any capacity for work, found ready employment at high wages. The authorities in charge of training the disabled found that the men would rather take the high wages then obtainable than take training, and became discouraged in their efforts to induce the men to accept training. The result of this is that since demobilization these disabled men have been thrown out of employment and are now applying for training, and the whole system is being overtaxed. In Canada it was compulsory that a man could not be discharged from the invalided section of the army without first being interviewed by a representative of the Training Branch of the Department of Soldiers Civil Re-establishment, with the result that the work was kept up to date and facilities provided in advance to take care of the greater numbers applying during demobilization.

From the time the armistice was declared until the first few months in the present year, training in Great Britain was administered by the following authorities:—

In the army, pre-discharge, the medical authorities are conducting occupational therapy, consisting of shoemaking, motor mechanics, carpentry, tailoring, and like subjects, as in Canada.

The combatant branch of the army has an educational campaign similar to the Khaki University, so that in some hospitals and military centres, motor mechanics classes, shoemaking shops, tailoring shops, etc., were conducted side by side by two different authorities.

The Ministry of Pensions is training disabled men after discharge but for the most part only in manual occupations.

The Ministry of Agriculture is training disabled men and others in agricultural subjects.

The Appointments Branch of the Ministry of Labour is conducting training for what might be called the officer class which is supposed to be confined to men of considerable education, training for other than manual occupations.

The Ministry of Pensions has in a small way occupational therapy in its hospitals. All told, therefore, there were six educational organizations in operation, all of which functioned independently, and without co-ordination.

The Government of Canada has placed all training for the disabled soldier or sailor in Canada, under the Department of Soldiers' Civil Re-Establishment, and the work is controlled by a Director of Vocational Training with representatives in each province directly responsible to him, therefore, direct co-ordination of all branches of training for the disabled is obtained.

The largest branch of this work in England is the training for manual occupations by the Ministry of Pensions.

On the 1st May the British Government decided that the training for manual occupations conducted by the Ministry of Pensions should be handed over to the Ministry of Labour. This arrangement had been made some time previously but May 1 was the date on which the change was to be made, but the Ministry of Labour late in July had failed to make adequate arrangements for taking this work over, and as late as August 1 the great bulk of it was still being conducted by the Ministry of Pensions. Our report describes the work as conducted by the Ministry of Pensions, and we can only surmise from interviews had with the Ministry of Labour, what their plans are. Indeed, we feel that the Ministry of Labour have no well settled plans and are at present feeling their way.

The Ministry of Pensions conducts its work through approximately 360 local War Pensions Committees scattered through the British Isles. These local War Pensions Committees act voluntarily and are made up of prominent citizens in each locality. Their committee consist of representatives of employers, labour, war veterans, women's voluntary organizations and other prominent persons with no affiliation.

Most of the committees have a paid secretary who carries out the directions of the committee. A great many of these secretaries up to a short time ago were voluntary workers. Under each secretary is an office staff, which during the war was for the most part voluntary, but of which an increasing proportion is now being paid.

The following quotation is from a special report of a select committee on pensions in England: "—— in the cases of several typical local war pensions committees out of 336 male employees only 259 were discharged officers, N.C.O's or men, while if the total number of employees (including women) be taken, viz., 1,127—the proportion of discharged officers and men employed becomes even more unsatisfactory." In Canada on July 31st out of 5,609 employes only 2,031 or 36.3 per cent were females. The total number of male employees was 3,575 out of which 92.5 per cent had seen service with the Canadian Expeditionary Force.

The largest part of the staff of the local committees is made up of female workers. These local War Pension Committees administer in the district all the work coming under the Ministry of Pensions, such as the operation of hospitals for discharged soldiers, medical treatment, obtaining or repairs to orthopædic appliances, training, pay and allowances, both medical and vocational, supplementary grants, and up till a short time ago, the King's Fund.

The Ministry of Pensions in London issues from time to time to these various committees general instructions under which they operate. The local committees have power to operate under the instructions without reference to the head office authorities, except to report.

The net result of administration by local committees is that in some few districts which happened to have active, intelligent and fearless local committees, the work is splendidly done. In other districts where the committees are weak, very little, if any-

thing is being done. Owing to the services of the Committees being voluntary the head office at times finds difficulty in harmonizing the work as between the various committees.

During the war the soldiers were allowed by the Government supplementary grants of one sort or another in addition to their pay. These grants were very similar to those made by the Canadian Patriotic Fund, and voluntary committees were formed by the Government to administer these supplementary grants, which committees finally grew into the local War Pensions Committees. Since most of the work was done for soldiers' dependents (mostly wives and children) it naturally followed that most of the administration, and properly so, was conducted by women, and this probably accounts for the large number of women now employed.

The staff of the local Pensions Committee has for the most part no power to put a man on pay and allowances or decide anything. Its members merely interview and arrange and bring all matters up to be confirmed before action by the local committee. The local committee for the most part sits twice a week so that practically all decisions are held up until these weekly or bi-weekly meetings take place. They are usually called for 1.30 or 3 p.m. and sit until 8 or 9 in the evening, thus overworking the staff and preventing clear thinking and action, and delaying the work in the office. The result of this is that although the local committees have power to grant training and treatment it takes so long to get a man actually started in a course that many grow discouraged.

It is probably not necessary to argue that successful co-operation is built on mutual understanding, and since the staff of the War Pensions Committees do not understand industrial conditions the lack of co-operation between the industries and the labour unions in regard to training is partially explained.

The foregoing difficulties applied not only to training but to treatment and the other activities of the War Pensions Committees, but from now on what will be said will apply to training only.

In an endeavour to co-operate with organized labour with regard to training, the following arrangements were made:—

Whenever it was thought advisable to train disabled men in a certain industry, the Minister of Labour asked the employers and labour unions in such a trade to appoint a National Advisory Committee to advise the minister. This committee consisted of an equal number of representatives from the employers and the employees, and they sat together, outlined the courses of training, the conditions under which training should be carried on in that industry, and the number of men trained from time to time. Local committees were then appointed under the National Committee to advise local War Pensions Committee. These committees, it should be noted, were all under the Ministry of Labour.

When a man applies for training he is interviewed usually by some of the voluntary staff of the local War Pensions Committee, and is then sent to the local Advisory Committee of a particular trade to see if it concurs in his being trained in that occupation. If he is accepted by the local Advisory Committee, he returns to the Pensions Committee as accepted, and the committee arranges for his training with the local educational authorities.

It will be seen, therefore, that three authorities are equally responsible for his training:—

1. The War Pensions Committee, who tentatively selected the course for him.

2. The local Advisory Committee of the Ministry of Labour, which was asked to concur in this course.

3. The educational authorities who are asked to give the training.

This system makes it impossible to tie down the responsibility for faults or deficiencies to any one person either in the districts or in the ministry itself.

We have described how local Trade Advisory Committees were set up in any particular trade. When we were in England there were about forty of these National Advisory Committees under the Ministry of Labour, but the fault of the system lies in the fact that there is no one committee which co-ordinates these forty, either in the districts or in London. The result of this is that in each trade the local Advisory Committee is upholding its own interests without reference to the general interests of the disabled men, organized labour, or the country at large.

Further, in regard to the Trades Advisory Committees we found that the local Pensions Committees are not allowed to train men in any occupation until the scheme is approved in London. The National Advisory Committee has to be set up first also local Advisory Committees, and the scheme worked out. This takes a great many months to accomplish, and in certain occupations, cited in the opening paragraphs, has not yet been accomplished, although negotiations have been in progress in some cases for two years. The result of this is that in industries where there is no approved scheme men, who were occupied in that industry before the war, have to be trained in some other occupation or wait until an approved scheme is arranged.

As an instance of this we may cite the case of electrical work. No scheme has been worked out for the electrical trades yet, so that an electrical fitter was sent to a Building Advisory Committee which was asked to accept him for training as a carpenter. The Building Committee felt that the man should not be accepted but were asked not to turn him down as since no scheme had been approved for electrical workers there was no training available in his old occupation, and the committee finally agreed to give him the course. Many instances of this kind were noticed and the impression your representatives gained was that those Advisory Committees which were doing their best to co-operate with the ministry were placed at a disadvantage by having their trade diluted by men from industries which were not co-operating. The errors in this system are, of course, cumulative. The time will shortly come in those trades which are accepting trainees from other trades, when there will be no room for men who were formerly in that occupation, or any other class of men.

Another fault of these approved schemes is that their operation precludes the training of disabled men in a large number of minor occupations available in Canada. The trainees are crowded into a small number of hard and fast approved occupations when many others could be taught if the local authorities were given freedom to adopt the training to the locality in which they operate.

This moving disabled men from one occupation to another is probably the greatest cause of trouble with the training system in England. Very little account seems to be taken of one of the first principles of training for the disabled, that each industry should absorb as far as possible all the men who were in it before the war.

We wish to call attention to the fact that most of the interviewing and preliminary assignment of men to courses is done in England by women. In one office which we visited there were six interviewers, all women. We can hardly conceive how a man would take any great interest in retraining when he was being advised by a voluntary female war worker as to whether he should become a bricklayer or a baker. It is quite true that after the preliminary interviewing is done these men pass through the local Trade Advisory Committees, but if a man is sent to the building committee by the interviewer when he should be sent to the brush-making committee, the initial error is made and it is hard to correct it. The fact seems to be lost sight of that men should be interviewed by those who are quite familiar with the conditions under which the candidates are to work, and that especially returned soldiers should be interviewed by men who themselves have been through the war. Even before the local committees the men are called in one by one and their cases laid before the local committee by a female secretary.

We found that the Ministry of Pensions had set up very few, if any, special schools, and that their training was limited to putting men into such technical institutions as

existed prior to the outbreak of war or into workshops. In some of these technical schools the disabled soldiers were mixed in with young boys without any special form of instruction. In other schools special courses were provided for them and special classes, but there was very little special apparatus or equipment supplied for this extra training.

In general, however, in England we found that the technical schools had shut out a great many of their civilian students in order to take care of the disabled, which seemed a doubtful policy to pursue. In London we found that the training in some of these institutions was of a very high grade. As instances of this we might cite the St. Bride's Printing School, the Cordwainers' Institute for teaching Bootmaking, the Central School of Art, the Clapham School of Building Trades, and the London Polytechnical Institute.

It is not the purpose of your representatives to comment on the organization of technical shools for teaching civilians, but we wish to point out that the schools mentioned are trade schools rather than technical schools. The students are taught finished processes along with the underlying principles and acquire a large amount of mechanical dexterity as well as the academic side of their training.

These schools for the most part occupy buildings or flats near the industries concerned. The St. Bride's Printing School is in the heart of the printing district, the Cordwainers' Institute is in the heart of the wholesale shoe district, and these institutions are in practically every case run and controlled by a Board of Directors all of whom are interested in the trade concerned, either as employers or representatives of employees and they work very closely in conjunction with the trade. Schools of this type are admirably suited for the training of disabled men.

Probably the best example of factory training existing anywhere to-day is the diamond industry in England. Diamond cutting was practically controlled by Belgium and Holland before the war, but through the efforts of Major Mitchell, late Director of Training, Mr. Oppenheimer, who was a large diamond merchant in England, set up factories for training disabled men in that industry, and now has about 1,000 men trained or in training under very fine factory conditions. The work is light and lends itself peculiarly to men having injuries in the lower extremities or trunk of the body.

Three factories have been set up, one in England, one in Wales and one in Scotland, with possibilities of others being set up as the work expands.

The Ministry of Labour seemed to be paying more attention to the training of machinists than any other trade. The Ministry of Munitions had some very fine training schools for machine operators which had been turned over to the Ministry of Labour. One of these schools in Birmingham was equipped with over a million dollars worth of machinery. Three others, one at Loughborough, one at Twickenham and one at Whitechapel, had from $250,000 to $500,000 worth of machinery each.

These schools were endeavouring to train a large number of men on the American system of mass production. A large number of the trainees had considerable experience in other trades, which was being wasted, while we found men with considerable experience as machinists who were being trained as bricklayers, carpenters, etc., apparently a great waste of energy.

In the printing trade the local Advisory Committees refused definitely to accept any man for training who had not had some experience in the printing trade prior to the war. We found in this trade that men whose pre-war occupation had been in such branches as press operators, stereotypers, etc., were being taught to operate linotype and monotype machines, provided they were considered able to learn that branch of the trade by the local Trades Advisory Committee, which was composed largely of master printers and representatives of the employees.

In the Printing Advisory Committee we noticed what we considered one fault of the hard and fast approved apprenticeship schemes set up by the Ministry of Pensions.

A man who before the war had some experience in printing was given a course as a stereotyper. He had become, in the opinion of the committee, competent to continue that work. One of the master printers offered to employ him at the union rate of pay. However, his employment in this capacity was objected to because the approved scheme called for training a man as an electrotyper as well as a stereotyper and he had not taken electrotyping.

In regard to these approved schemes which have been issued by the Ministry of Pensions from time to time we were informed by Mr. Curry, the director of training in the Ministry of Labour, who had taken over disabled training, that they are not considered successful. The Ministry of Labour apparently has not decided what it will substitute in place of them, but are now negotiating with the employers and organized labour to find some substitute scheme.

In addition to the 15,000 disabled men trained or in training, there were also about 10,000 ex-members of the Imperial Forces who were not disabled who had been trained or were receiving training at the end of April, but a large number of these had been trained as munition workers. We could not find any authority under which these men were given training. A number were over 40 years of age and were being taught trades. They were apparently taken into the training system under one pretext or another, but without authority.

Of course, while it is the duty of your representatives to report facts and not criticize the policy of training in England, we cannot help saying that it seems unjust to use up the available facilities for training demobilized fit men when large numbers of disabled men who cannot seek ordinary employment, are awaiting training. It is hardly necessary to say that a disabled man who cannot go back to his former occupation will deteriorate more quickly through idleness than the man who is physically fit. The disabled men should be taken care of first.

The chief objection of organized labour to the scheme lies in two things:—

1. That men are being constantly taken out of one trade and being put into another, instances of which have been cited in the opening paragraphs.
2. We are informed by Mr. Bramley, the assistant secretary to the Parliamentary Labour Committee that the labour party in England is not opposed to the Ministry of Labour training disabled men, but they are opposed to the Ministry of Labour partially training so many demobilized physically fit men.

The attitude of the labour unions seemed to be that they have every sympathy with and would give every assistance to the authorities in training disabled men, even if the courses were shorter than the ordinary apprenticeship system governing trades in England, but they do object to giving these short courses to physically fit men, and feel that such men should learn their trade by the ordinary methods, or go back to their previous occupation.

About 250 widows of soldiers had accepted or been granted training, and for the most part these were the widows of officers. In general no one was allowed to take training who had children to look after. There did not seem to be much encouragement given to the widows of privates to take training, the idea seemed to be that they could take ordinary work in a factory. While there was no definite pronouncement on the point it seemed that this training was more for officers' widows who were being fitted to become secretaries and for the other light and congenial work.

The training for officers and men for professions and like occupations is controlled by the Appointments Branch of the Ministry of Labour.

In England the training of officers and privates is absolutely separate. In one school we found two classes for motor mechanics side by side, one for the training of officers and one for the training of privates. There was equal equipment and space for each class, but in one there were 8 officers and in the other about 20 privates.

In some places where the Ministry of Pensions had established boarding houses for the trainees, they had a separate house for the officers in training. Even the pay and allowances during training for officers are different from the allowances for privates. There is no set sum to which they are entitled. The Appointments' Branch are given power to inquire into the officer's private circumstances and income, also that of his father or guardian, and if it is found that he or his father can help to support him he receives no pay and allowances. If he has a small income of his own this is supplemented by the Ministry.

As to pay and allowances, these are less in general than they are in Canada, but we should point out the fact that the Minister of Pensions has two scales of pay and allowances, one called the statutory scale, and the other scale made by Order in Council. Even the Ministry of Labour has a different scale for the men they are training, and the officers another scale. Men who apply for training have a tendency to go from one of these departments to another to see where they can get the best terms.

The training allowances in England are much lower than they are in Canada, single men and married men without families are allowed 33s. a week or the equivalent of $8.25, while in Canada a single man receives $60 a month, a married man without children $85 a month, and a further grant for children of $10 a month for the first child, $8 for the second, $7 for the third and $6 for each additional child.

The lack of any co-ordination between the various authorities conducting training in England leads to a great deal of confusion, and we may say that we did not find one person who could tell us all about the training there. We had to learn from each authority what they were doing, and found in most cases they knew practically nothing about what the others were doing or the regulations under which they operated.

The impression left on your representatives of the training in England was that of a wide and ambitious programme on paper, very little of which was carried out. We feel that the better policy is to properly take care of the disabled man who cannot follow his pre-war occupation, rather than dissipate the energy necessary for this work in many other diversified activities.

Our investigations in England lead us to emphasize the practical results already obtained in Canada, and we would suggest that every effort be made to make the training of disabled men more practical if possible. The nearer training for the disabled soldier in school can be made to approach factory conditions the better. We also believe that every effort should be made to increase the number of subjects in which disabled men are trained beyond the large number (350) already available; that never-ending care should be taken to have each man, as far as possible, take advantage of what skill he had before the war, and that so far as possible each occupation should absorb its own disabled men. This last is the key principle around which any system of training disabled men should be built.

Your representatives wish to express their appreciation of the untiring efforts of Mrs. Ethel M. Wood, Secretary of the Local War Pensions Committee for the London area, to assist them in their investigations. To Mrs. Wood to a great extent is due the arrangements which enabled them to see so much of the work in so short a time.

Respectfully submitted,

W. E. SEGWORTH,
THOS. A. STEVENSON.

OTTAWA, Ont., August 31, 1919.

APPENDIX V.

Negotiations with the Government of the United States and Reciprocal Agreement between the Department of Soldiers' Civil Re-establishment and the Bureau of War Risk Insurance—Report of the Assistant Deputy Minister—Orders In Council authorizing action by Department.

OTTAWA, 27th October, 1919.

SIR,—I have the honour to inform you that, in accordance with instructions received, I proceeded to Washington on the 16th instant, with a view to discussing with the proper departments of the Government of the United States the question of reciprocal arrangements between the Department of Soldiers' Civil Re-Establishment and those departments, in respect of treatment of ex-members of the United States forces resident in Canada and ex-members of the Canadian Forces resident in the United States.

I was accompanied by Dr. W. C. Arnold, Deputy Director of Medical Services, and Major R. W. Coulthard, Director of the Orthopaedic and Surgical Appliances Branch of this department, and Major W. A. Burgess, of the Board of Pension Commissioners for Canada.

On the 18th instant a conference was held at the office and under the presidency of Surgeon General Blue, the head of the Public Health Service of the United States, at which were present:—

Lieut.-Colonel G. Chomeley-Jones, Director of the Bureau of War Risk Insurance.

Colonel W. C. Rucker, Chief Medical Advisor of the Bureau of War Risk Insurance.

Lieut.-Colonel Hallett, Assistant Director of the Bureau of War Risk Insurance.

Lieut.-Colonel Maddox, Orthopaedist of the Bureau of War Risk Insurance.

Dr. W. G. Stimpson, Assistant Surgeon General, Public Health Service.

Dr. Lavinder, Assistant to Dr. Stimpson, and

Colonel McDill, Chief Medical Officer of the Federal Board of Vocational Re-Education.

Further conferences were held, under the presidency of Lieut.-Colonel G. Chomeley-Jones, in the office of the Director of the Bureau of War Risk Insurance. The result of the deliberations is set forth in the attached memorandum of proposed agreement. This agreement will be ratified by the Bureau of War Risk Insurance, which controls the treatment of ex-members of the United States Forces, as soon as Bill H.R. 8778, which has passed the House of Representatives, has been approved by the Senate of the United States.

I cannot speak too highly of the manner in which Lieut.-Colonel Chomeley-Jones, Surgeon General Blue and the other officials of the United States Government, with whom we came into direct contact, met the proposals which were submitted. A large amount of time was devoted by these gentlemen to the consideration of the questions involved, and every effort was made to arrive at a conclusion which would be mutually satisfactory to the Governments of Canada and the United States. If the attitude of the officers of the Bureau of War Risk Insurance and of the United States Public Health Service can be taken as an augury of the success of the reciprocal arrangements outlined in the memorandum, these arrangements will be satisfactory to all concerned.

and will enable this department adequately to care for the requirements of those ex-members of the Canadian and British Forces resident in the United States, who may hereafter require medical or surgical treatment.

While the agreement cannot legally be promulgated until after the passage of the Bill referred to by the Congress of the United States, the arrangements outlined will be acted upon in all necessitous cases without waiting for such action.*

I have the honour to be, Sir, your obedient servant,

(Sgd.) E. H. SCAMMELL,
Assistant Deputy Minister.

The Hon. Sir JAMES A. LOUGHEED, K.C.M.G.,
Minister of Soldiers' Civil Re-Establishment,
Ottawa.

MEMORANDUM of proposed agreement discussed between representatives of the Bureau of War Risk Insurance and the Public Health Service of the United States, and representatives of the Canadian Department of Soldiers' Civil Re-Establishment and of the Board of Pension Commissioners of Canada, at Washington, October 18, 20, and 21, 1919.

In this agreement whenever the "Bureau" is referred to it shall mean the Bureau of War Risk Insurance of the United States and whenever the "Department" is referred to it shall mean the Department of Soldiers' Civil Re-Establishment of Canada. Unless otherwise indicated all communications directed to be sent to the Bureau shall be addressed "The Director of the Bureau of War Risk Insurance, Washington, D.C.," and all communications directed to be sent to the Department shall be addressed "The Department of Soldiers' Civil Re-establishment, 22 Victoria Street, Ottawa, Ontario."

Whereas the Department is charged with the duties of providing treatment and training for ex-members of the Canadian forces who have suffered a disability due to or aggravated by war service;

And whereas it has been provided by Order in Council, passed by the Government of Canada, dated the 24th February, 1919 (P.C. 387), that

"The Department, with the approval of the Governor in Council, may from time to time, and in its discretion make arrangements with the Governments of His Majesty's Allies for the treatment and training of all persons who have served in the Naval or Military Forces of His Majesty's Allies during the present war, and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada, whether *bona fide* resident in Canada at the outbreak of the present war or not, and may render accounts for the cost of such treatment or training";

And whereas by Order in Council, passed by the Government of Canada, dated the 3rd March, 1919 (P.C. 424), (a copy of which is attached hereto marked Schedule A), the Department was authorized to enter into negotiations with representatives of the Government of the United States;

And whereas a letter dated 28th May, 1919, was received by the Department from Surgeon General Rupert Blue, of the Public Health Service of the United States, agreeing to provide treatment for ex-members of the Canadian forces, when resident

* The Bill referred to was duly passed by Congress and signed by the President of the United States on the 24th December, 1919, so that the following agreement is now operative.

in the United States, which letter was referred by the Minister of Soldiers' Civil Re-Establishment to the Privy Council of Canada and was embodied in an Order in Council dated 1st July, 1919 (P.C. 1342), (a copy of which is attached hereto marked Schedule B);

And whereas by a Bill (H.R. 8778) now before the Congress of the United States, it is provided

> "(9) That the Bureau of Wark Risk Insurance is hereby authorized to furnish the medical, surgical and hospital services and the supplies and appliances provided by subdivision (6) hereof, and necessary transportation to and from places of examination or treatment, to discharged members of the military or naval forces of those Governments which have been associated in war with the United States since April 6, 1917, and come within the provisions of laws of such Governments similar to the War Risk Insurance Act, at such rates and under such regulations as the Director of the Bureau of War Risk Insurance may prescribe; and the Bureau of War Risk Insurance is hereby authorized to utilize the similar services, including transportation as aforesaid, supplies, and appliances provided for the discharged members of the military and naval forces of those Governments which have been associated in war with the United States since April 6, 1917, by the laws of such Governments similar to the War Risk Insurance Act, in furnishing the discharged members of the military and naval forces of the United States who live within the territorial limits of such Governments and come within the provisions of subdivision (6) hereof, with the services, supplies and appliances provided for in such subdivision and transportation as aforesaid; and any appropriations that have been or may hereafter be made for the purpose of furnishing the services, supplies, and appliances provided for by subdivision (6) hereof, and transportation as aforesaid, are hereby made available for the payment to such Governments or their agencies for the services, including transportation as aforesaid, supplies and appliances so furnished at such rates and under such regulations as the Director of the Bureau of War Risk Insurance may prescribe."

And whereas an arrangement has just been effected by the Department with the Ministry of Pensions of the British Government, whereby the Department has undertaken the responsibility for the provision of treatment for any ex-members of British Imperial forces resident in the United States of America;

And whereas it is the desire of the parties hereto to enter into and conclude a reciprocal agreement providing for the treatment of ex-members of the forces of Canada and of the United Kingdom when resident in the United States of America, and of ex-members of United States forces when resident in Canada.

It is therefore proposed, that, subject to modification and changes from time to time, the following procedure shall be adopted:

1. TREATMENT OF EX-MEMBERS OF THE UNITED STATES FORCES RESIDENT IN CANADA.

(*a*) When an ex-member of the United States forces resident in Canada requires medical treatment for a disability which he considers to be due to or aggravated by war service, he shall apply to the nearest medical representative of the Department who shall examine him and make such recommendations as he may consider desirable to the Unit Medical Director of the Department. The medical representative shall state the nature of the disability from which the man is suffering, whether or not it appears to be due to service, what form of treatment, if any, is required, the probable duration of such treatment, and whether or not the man is able to carry on a gainful occupation. This report shall be made on appropriate United States' forms. The medical representative

shall assure himself from documentary or other evidence of the identity of the man applying to him and that he is entitled to treatment by reason of his military service.

(*b*) If it is apparent that immediate treatment is required for what appears to be a war disability, the local medical representative can give the treatment, or order the man to hospital, without waiting for specific authority.

(*c*) Immediately an ex-member of the United States forces reports to a local medical representative for treatment, that representative will communicate with the Unit Medical Director, in order to obtain particulars regarding the man's medical history, and the Unit Medical Director will telegraph to the Director of Medical Services, Ottawa, who will ask the bureau for the necessary information.

(*d*) If an ex-member of the United States forces requires occasional treatment, such as the dressing of a wound, massage, removal of pieces of shrapnel, etc., which does not require him to stop his civilian occupation, he will be entitled to attend at the office of a medical representative or a clinic of the department, according to direction, and to receive such treatment or medicine as he may require.

(*e*) Ex-members of the United States forces suffering from tuberculosis requiring sanitarium treatment will be placed in a sanitarium.

(*f*) If it is decided that an ex-member of the United States forces will do better at his own home than in hospital or sanitarium, he will be visited periodically by a medical representative of the Department. Men in this category are known as Class 1 Out-Patients (O. P. 1). Men in the category referred to in subparagraph (*d*) above are known as Class 2 Out-Patients (O. P. 2).

(*g*) Insane ex-members of the United States forces will be placed either in hospitals for the insane provided by the Department, or in Provincial institutions. The maintenance paid in the latter case will be the net cost to the Province. If it is considered desirable, by the Bureau, in the interests of the patient, that he should be transferred to the United States, arrangements for deportation will be made.

(*h*) All illnesses of short duration, if deemed advisable, will be treated locally in Canada, but cases of long duration, except tuberculosis, will, unless otherwise decided, be transferred to the United States, and treated in such hospitals of the United States as the Bureau may determine.

(*i*) Immediately a Unit Medical Director of the Department has received information that an ex-member of the United States forces requires treatment and has admitted such ex-member of the forces to hospital, a notification will be forwarded to the Department on appropriate form, reporting the admission of patient to hospital or commencement of treatment and a report will at once be forwarded by the Department to the Bureau.

(*j*) Cases admitted to hospital will be taken on the strength of the Department in the unit "for treatment only." It is understood that the bureau is only obligated to treat disabilities of persons discharged from military or naval service for a disease or injury the result of, or aggravated by service. Any disease or injury which occurs subsequent to discharge and which cannot be associated as a sequel or aggravation of the original disability is not an obligation of the bureau for attention, except as it may aggravate a condition arising out of service.

(*k*) When disabilities are not due to service a report may be forwarded to the Director of Medical Services, Ottawa, when the case will be referred to the bureau, but treatment should not be undertaken by or at the expense of the department.

(*l*) On conclusion of treatment, a report on appropriate form shall be prepared in triplicate and shall be disposed of as follows: Two copies to the Director of Medical Services, Ottawa (one of which will be forwarded by him to the bureau), and one copy for local files. This form will be accompanied by a letter giving any information not included in the medical report which might be of value to the United States authorities.

(*m*) If the Director of the Bureau desires a report upon an ex-member of the United States forces, either with a view to treatment, or with a view to the payment of compensation, a communication shall be sent to the Director of Medical Services, Ottawa, and the Director of Medical Services shall arrange for such report to be made.

(*n*) Any case of refusal of treatment shall be reported by the Unit Medical Director immediately to the head office of the department, with the reasons given by the man for such refusal and the action taken with a view to persuading him to accept or continue treatment. The report should state whether, in the opinion of the medical representative attending the man, or the medical suprintendent of the institution in which he has been receiving treatment, such refusal is reasonable or unreasonable. On receipt of this information by the Director of the Bureau, the Director will advise the department of any action he may desire to have taken in the matter. Misconduct in hospital, resulting in dismissal, shall be deemed to be unreasonable refusal to continue treatment.

(*o*) In the event of the death of an ex-member of the United States forces, while undergoing treatment in Canada, duplicate copies of death certificate, accompanied by appropriate form in duplicate, shall immediately be forwarded by the local representative of the department to the head office of the department, which will forward one copy to the bureau. If the name and address of the next of kin are known and such person resides in Canada, the local representative of the department shall at once notify such person by telegraph, in order that arrangements may be made for the funeral. If the next of kin does not reside in Canada, the local representative shall notify by telegraph the head office of the department which will notify by telegraph the bureau.

(*p*) Transportation, at the rates for ex-members of the Canadian forces, will be provided by the department for ex-members of the United States forces who may require the same for travel to and from hospital, or to and from places of medical examination, or to and from places where artificial limbs are fitted, and the department shall charge the bureau the net cost of such transportation.

2. TREATMENT OF EX-MEMBERS OF THE CANADIAN FORCES RESIDENT IN THE UNITED STATES.

(*a*) When an ex-member of the Canadian forces, resident in the United States, requires medical treatment for a disability which he considers to be due to, or aggravated by war service, he shall apply to the nearest medical representative or officer of the bureau (United States Public Health Service or other designated agency) who shall examine him and make such recommendations as he may consider desirable, through the supervisor of the district to the Director of the Bureau. The medical representative shall state the nature of the disability from which the man is suffering, whether or not it appears to be due to service, what form of treatment, if any, is required, the probable duration of such treatment, and whether or not the man is able to carry on a gainful occupation. This report shall be made on apropriate Canadian forms. The medical representative shall assure himself, from documentary or other evidence, of the identity of the man applying to him, and that he is entitled to treatment by reason of his military service.

(*b*) If it is apparent that immediate treatment is required for what appears to be a war disability, the medical representative of the bureau can give the treatment or order the man to hospital without waiting for specific authority.

(*c*) Immediately an ex-member of the Canadian forces reports to a medical representative of the bureau for treatment that officer will communicate with the district supervisor in order to obtain particulars regarding the man's medical history, and the district supervisor will telegraph to the bureau, which will ask the department for the necessary information.

(*d*) If an ex-member of the Canadian forces requires occasional treatment, such as the dressing of a wound, massage, removal of pieces of shrapnel, etc., which does

not require him to stop his civilian occupation, he will be entitled to attend at the office of a medical representative of the bureau, according to direction, and to receive such treatment or medicine as he may require.

(*e*) Ex-members of the Canadian forces suffering from tuberculosis, requiring sanitarium treatment, will be placed in a sanitarium.

(*f*) If it is decided that an ex-member of the Canadian forces will do better at his own home than in hospital or sanitarium, he will be visited periodically by a representative of the Bureau. Men in this category are known as Class 1 Out-Patients (O. P. 1). Men in the category referred to in sub-paragraph (*d*) above are known as Class 2 Out-Patients (O. P. 2).

(*g*) In the case of an ex-member of the Canadian forces who is insane, immediate arrangements shall be made by the district supervisor to provide accommodation in a hospital for the insane. In order that the dependents of such insane man may, if eligible, be granted an allowance during the time he is in hospital, the department will request the bureau to obtain the necessary particulars and certificates from dependents. If it is deemed desirable by the department, in the interests of the insane man, that he should be transferred to Canada, arrangements for deportation will be made.

(*h*) All illnesses of short duration, when advisable, are to be treated locally in the United States, but cases of long duration, except tuberculosis, should, unless otherwise decided, be transferred to Canada and treated in hospitals of the department or other institutions under its direction.

(*i*) Immediately a district supervisor has received information that an ex-member of the Canadian forces requires treatment and has admitted such ex-member to hospital, a notification will be forwarded to the bureau on appropriate form reporting the admission of the patient to the hospital, or commencement of treatment by the bureau, and a report will at once be forwarded by the bureau to the department.

(*j*) It is understood that the department is only obligated to treat, in the United States, disabilities of persons discharged from military or naval service for a disease or injury the result of or aggravated by service. Any disease or injury which occurs subsequent to discharge and which cannot be associated as a sequel or aggravation of the original disability is not an obligation of the department for attention, except as it may aggravate a condition arising out of service.

(*k*) When disabilities are not due to service a report may be forwarded to the Bureau when the case will be referred to the department, but treatment should not be undertaken by or at the expense of the bureau.

(*l*) On conclusion of treatment a report on appropriate form shall be prepared in quadruplicate and shall be disposed of as follows: Three copies to the director of the bureau (two of which will be forwarded to the Director of Medical Services, Ottawa), and one copy for local files. This form will be accompanied with a letter giving any information not included in the medical report which might be of value to the Canadian authorities.

(*m*) If the department desires a report upon an ex-member of the Canadian forces, with a view to treatment, a communication shall be sent to the Director of the bureau and the Director shall arrange for such report to be made.

(*n*) Any case of refusal of treatment shall be reported by the district supervisor immediately to the bureau with the reasons given by the man for such refusal, and the action taken with a view to persuading him to accept or continue treatment. The report should state whether, in the opinion of the medical representative attending the man, or the medical superintendent of the institution in which he has been receiving treatment, such refusal is reasonable or unreasonable. On receipt of this information by the department the department will advise the bureau of any action it may desire to have taken in the matter. Misconduct in hospital, resulting in dismissal, shall be deemed to be unreasonable refusal to continue treatment.

(*a*) In the event of the death of an ex-member of the Canadian forces while undergoing treatment in the United States, duplicate copies of death certificate, accompanied by appropriate form in duplicate, shall immediately be forwarded by the district supervisor to the bureau, which will forward one copy of each to the department. If the name and address of the next of kin are known, and such person resides in the United States, the district supervisor shall at once notify such person, by telegraph, in order that arrangements may be made for the funeral. If the next of kin does not reside in the United States the district supervisor shall notify, by telegraph, the Director of the bureau, who will notify by telegraph the department.

(*p*) Transportation at the rates for ex-members of the United States forces will be provided by the bureau for ex-members of the Canadian forces who may require the same, for travel to and from hospital, or to and from places of medical examination, or to and from places where artificial appliances are fitted, and the bureau shall charge the department the net cost of such transportation.

3. FUNERAL EXPENSES.

Should an ex-member of the Canadian forces, resident in the United States, or an ex-member of the United States forces, resident in Canada, die, leaving his family in such a position as to be unable to provide the necessary funeral expenses, arrangements may be made by the department or the bureau in cases where the death is due to a service disability, and the ex-member of the forces is undergoing treatment for the same, for the payment of funeral expenses, provided that the sum expended by the department or the bureau shall not exceed the sum of one hundred dollars (100).

4. ALLOWANCES OR COMPENSATION.

The department shall pay allowances to such ex-members of the forces of Canada who are undergoing treatment in hospitals under the bureau as may be entitled to the same in accordance with Canadian rates, and the bureau shall pay compensation to such ex-members of the forces of the United States who are undergoing treatment in hospitals under the department as may be entitled to the same at American rates.

5. PROSTHETIC APPLIANCES.

(*a*) Ex-members of the United States forces resident in Canada who require artificial limbs or other prosthetic appliances or renewals of or repairs to the same, shall apply to the Unit Medical Director of the district in which such ex-member resides, when he will be examined and provided with a prescription as required by a medical officer of the department. When the repair or renewal does not affect the surgical fit, the ex-member of the forces may apply direct to the Orthopaedic Fitting Depot in the district in which he resides, and receive the necessary attention.

(*b*) Ex-members of the Canadian forces resident in the United States shall apply to the nearest representative of the bureau (United States Public Health Service or other designated agency) in the district in which he resides, for all appliances and for all repairs and renewals of such.

(*c*) Where it is found that renewals or repairs cannot be effected locally the representative of the Bureau shall communicate direct with the Director of Orthopaedic and Surgical Appliances Branch of the department, 185 Spadina Avenue, Toronto, Canada, sending all necessary data, and if necessary, a cast of the stump and measurement charts, in the case of amputations, when supply will be made from the factory at Toronto. If the member of the Canadian forces is possessed of a duplicate appliance, or if it is possible for him to relinquish the appliance for the time required for repairs, or renewals, the appliance shall be forwarded to the Director of Orthopaedic and

Surgical Appliances Branch direct, when the necessary repairs will be made, and the limb or other appliances returned to the representative of the bureau, who will assure himself that it is satisfactory, and will forward a certificate to this effect signed by himself and the ex-member of the forces to the Director of the Orthopædic and Surgical Appliances Branch.

(*d*) In each case, the ex-member of the Canadian or the United States forces shall have the option of applying for the appliance provided by the regulations of the Government under which he served, or of the Government under whose jurisdiction he has placed himself, as a resident, whether Canadian or United States, respectively.

(*e*) Each Government shall charge the other with the actual factory cost of appliances, renewals or repairs, and such cost shall not include overhead charges due to administration expenses or equipment. The bureau shall provide the department with a list, including addresses, of makers of artificial limbs and other appliances from whom the Government of the United States makes purchases, together with their agents or agencies and price lists of each.

(f) For purposes of measurement and report the bureau and the department shall prepare forms which can be used in Canada and the United States and shall issue these forms as they may be required.

6. COST OF TREATMENT, ETC.

The department and the bureau mutually agree each to charge the other its out-of-pocket costs for examinations, treatment, and maintenance in hospital, only. No overhead expenses, such as the salary of medical officers or others employed by the department or the bureau on a salary basis, shall be charged in respect of medical treatment or examination, but in the treatment or examination of cases where the department or the bureau has no regular representative or where local practitioners are remunerated on a schedule of pay according to work done, the fees payable in accordance with such schedules, issued by the department and the bureau respectively, shall be payable. The charges payable shall include the following:—

(*a*) Cost of hospital treatment. Where such cost is paid by the department or bureau to an institution not controlled by the department or bureau, it will be the actual amount paid out. Where an ex-member of the Canadian or United States forces is undergoing treatment in a hospital operated or utilized by the department in Canada, or in a hospital operated or utilized by the bureau in the United States, the amount to be charged shall be the same as would be the charge against any other branch of the Government service, and shall be based upon absolute cost.

(*b*) Net travelling expenses, including the cost of transportation incurred by the department or the bureau for escorts or otherwise.

(*c*) Net cost of prosthetic appliances.

(*d*) Any other charges which may be mutually agreed upon from time to time.

7. EX-MEMBERS OF THE BRITISH IMPERIAL FORCES IN THE UNITED STATES.

Whenever the term "ex-members of the Canadian Forces" is used in this agreement, it shall include ex-members of the forces of the United Kingdom of Great Britain and Ireland, the Government of Canada having agreed to deal with these men in exactly the same way as though they had served in the forces of Canada.

8. Instructions to be approved by the bureau shall be addressed by the department to its unit officers and instructions to be approved by the department shall be addressed by the bureau to its district supervisors or other representatives regarding the procedure herein set forth, and such further instructions or modifications as may hereafter be determined upon.

9. In view of the fact that arrangements have been made by the British Ministry of Pensions, through the department, for the treatment of ex-members of British Imperial forces in Canada and the United States, it is thought desirable that negotia-

tions be at once entered into, through the proper diplomatic or other official channels, so that reciprocal arrangements may be completed forthwith, for the treatment of ex-members of United States forces when resident in the United Kingdom.

The following Orders in Council, together with clauses 3 and 4 of P.C. No. 87 (Appendix VIII), constituted the authority for the Department of Soldiers' Civil Re-Establishment to enter into the foregoing agreement:—

P.C. 424.*

Certified Copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 3rd March, 1919.

The Committee of the Privy Council have had before them a report, dated 17th February, 1919, from the Minister of Soldiers' Civil Re-Establishment, submitting that it is necessary to make provision for the post-discharge treatment and care of members of the Canadian forces who are resident in the United States of America, and also to make arrangements for similar treatment and care of members of the American Expeditionary Force resident in Canada.

The Director of Medical Services and the Assistant Deputy Minister of the Department of Soldiers' Civil Re-Establishment visited Washington recently, and held an informal conference with Lieut.-Col. Chas. E. Banks, of the United States Public Health Service, Chief Medical Advisor to the War Risk Insurance Bureau, with Mr. Thomas B. Love and Mr. J. H. Moyle, Secretaries of the Treasury, and with Dr. Prosser, Director of the Federal Board on Vocational Training.

It was desired to ascertain, before any definite proposal was made, whether the Government of the United States had facilities at its disposal which would render unnecessary the establishment of a Medical Service under the Department of Soldiers' Civil Re-Establishment in the United States. The gentlemen agreed with the proposal submitted and expressed themselves as desirous of entering into a reciprocal agreement with the Government of Canada stating that, if necessary, legislation would be passed by the United States Congress to give effect to such agreement.

It is not possible to estimate the number of citizens of the United States who will require treatment or training in Canada during the next two or three years. In Western Canada, it is probable that the number will be large. Nor is it possible to state, with exactitude, the number of members of the Canadian Expeditionary Force whose residence is in the United States of America who will require treatment or training there; but there will be a substantial number. It is also possible that the British Government may desire to have the Government of Canada watch over the interests of the ex-members of its forces, in the United States as well as in Canada. It is submitted that it will be much more economical and satisfactory to arrange with the Government of the United States for post-discharge treatment and training than it would be if the Government of Canada were to set up medical and vocational training services in that country. On the other hand it is suggested that the Department of Soldiers' Civil Re-Establishment should be empowered to place its facilities at the disposal of the Government of the United States for members of the forces of that country resident in Canada.

It is not proposed that the Department of Soldiers' Civil Re-Establishment shall charge the Government of the United States any overhead expenses such as the salary or portion of the salary of its regular medical or vocational officers, as these officers would necessarily be employed whether American soldiers and sailors received treatment or training or not. But in the treatment of individual cases in small towns where the department has no regular representative, and local practitioners are

* Re-enacted by Order in Council P.C. 2324, dated 21st November, 1919, passed under authority of Soldiers' Civil Re-Establishment Act, 1919.

employed on a schedule of pay according to work done, it would be necessary to make this a charge against the United States Government, as it is made a special charge against this department. It is submitted that similar arrangements might be made by the Government of the United States.

The Committee therefore recommend that Your Excellency may be pleased to inform His Majesty's Ambassador at Washington in the sense of this minute, and to request him to inquire if the United States Government would approve in principle of such an arrangement between the two Governments for the reciprocal treatment of members of the forces of each resident in the country of the other as has been above described, and in that case would sanction conferences between their representatives and those of the Canadian Department of Soldiers' Civil Re-Establishment, with the object of deciding what measures may be necessary for giving effect to the policy either by administrative action, or, if necessary, by legislation.

All of which is respectfully submitted for approval.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

P.C. 1342.

Certified copy of a Report of the Committee of the Privy Council, approved by the Deputy Governor General on the 1st July, 1919.

The Committee of the Privy Council have had before them a Report, dated 24th June, 1919, from the Minister of Soldiers' Civil Re-Establishment, stating that, in pursuance of the provisions of Order in Council (P.C. 424), dated the 3rd March, 1919, the following communication, suggesting certain arrangements for the post discharge care and treatment of former members of the Canadian Forces who are now resident in the United States, has been received from the Treasury Department, Bureau of Public Health Service, Washington, D.C.,—

> "You are advised that the Secretary of the Treasury has authorized the admission of discharged Canadian Soldiers to the hospitals of the Public Health Service for treatment, provided the Canadian Government reimburse this Service for such care and treatment.
>
> At Public Health Service stations of the first class, that is, at hospitals owned or operated by the Public Health Service, the per diem rate for such care and treatment will be the same as is now charged for the care of foreign seamen, which, is during the present fiscal year, $1.50 for each patient. At hospitals under contract with the Public Health Service, the rate will be the contract rate in each case. A copy of T.D. 37671, contracts for the care of seamen, etc., for the current fiscal year, giving the majority of hospitals under contract with this service, showing the per diem rates, etc., is enclosed herewith.
>
> The proposed procedure is to have all repayment accounts sent to the Bureau of the Public Health Service and subsequently forwarded to your office for reimbursement.

A copy of T.D. 37671, contracts for the care of seamen, etc., referred to in the above communication, is submitted herewith.

The Minister further states that the arrangements outlined in the foregoing communication by the United States Secretary of the Treasury, are in accord with the proposals made by the Department of Soldiers' Civil Re-Establishment.

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-Establishment Act, 1919.

The Minister, therefore, recommends that the same be approved, and that the Department of Soldiers' Civil Re-Establishment be granted authority to re-imburse the Bureau of Public Health Service, Washington, D.C., for any expenses incurred in connection therewith.

The Committee concur in the foregoing recommendation, and submit the same for approval.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

APPENDIX VI.

Department of Soldiers' Civil Re-establishment Act, 1918, with Amending Act, 1919.

8-9 GEORGE V.

CHAP. 42.

An Act respecting the Department of Soldiers' Civil Re-establishment.

[*Assented to 24th May, 1918.*]

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as *The Department of Soldiers' Civil Re-establishment Act.*

2. (1) There shall be a Department of the Government of Canada to be called "The Department of Soldiers' Civil Re-establishment" over which the Minister of Soldiers' Civil Re-establishment shall preside.

(2) The Minister shall hold office during pleasure, and shall have the management and direction of the Department.

3. The Governor in Council may appoint a Senator or a Member of the House of Commons to be Parliamentary Secretary of the Department of Soldiers' Civil Re-establishment, who shall have and perform such powers and duties as the Governor in Council may from time to time prescribe.

4. (1) The Governor in Council may appoint an officer who shall be called "The Deputy Minister of Soldiers' Civil Re-establishment," who shall be the deputy head of the Department, and who shall hold office during pleasure.

(2) Such other officers, clerks and employees as are necessary for the proper conduct of the business of the Department may be appointed, all of whom shall hold office during pleasure.

5. The Minister shall have the management and control of all matters relating to the re-establishment in civil life and activities of all persons who have served in the naval or military forces of His Majesty or any of His Majesty's allies during the present war, and the dependents of such persons, and the administration of any statutes or of any regulations or orders enacted or made by the Governor in Council for such purpose: Provided, however, that nothing in this Act shall be deemed in any way to affect the powers or duties of the Board of Pension Commissioners for Canada.

6. The Minister shall annually lay before Parliament, within ten days of the meeting thereof, a report of the business, transactions and affairs of the Department during the year then next preceding.

7. The exercise or performance by the Minister of Soldiers' Civil Re-establishment since the twenty-first day of February, one thousand nine hundred and eighteen, of any power or duty conferred upon him by any Order in Council is hereby sanctioned, ratified and confirmed.

10 GEORGE V.

CHAP. 29.

An Act to amend The Department of Soldiers' Civil Re-establishment Act.

[*Assented to 10th November, 1919.*]

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. Section five of The Department of Soldiers' Civil Re-establishment Act, chapter forty-two of the statutes of 1918, is hereby repealed, and the following is substituted therefor:—

"5. (1) The Minister shall have the management and control of all such matters as are assigned to him from time to time by the Governor in Council, relating in any way to the re-establishment in civil life of all persons who since August 1, 1914, served in the Naval or Military Forces of His Majesty or any of His Majesty's allies, and to the care of the dependents of such persons.

"(2) Subject to the approval of the Governor in Council, the Minister may make such regulations from time to time as he may deem necessary and advisable,—

"(*a*) For the control and management of any hospital, workshop, home, school, or other institution, owned, acquired, or used by His Majesty for the training, care or treatment of persons who have served in the Great European War which commenced in August, 1914, and of the persons undergoing care, treatment or training therein, or who receive any benefit administered by the Minister;

"(*b*) For granting authority to the Minister, subject to rules and regulations approved by the Governor in Council, to employ such technical and special temporary staff as may be required to meet the special conditions that may arise in carrying on the work with which the Minister is charged, notwithstanding The Civil Service Act, 1918, and amendments thereto, and other similar Acts bearing on the Civil Service of Canada: Provided, however, that the rules and regulations referred to shall contain such appropriate provisions as are necessary to have such appointments from time to time as required certified by the Civil Service Commission;

"(*c*) For the marking or stamping of artificial limbs or appliances issued from the Department, and to prevent the removal or defacement of such stamps or marks or the use of any counterfeit thereof, and to prevent the purchase, sale, receiving or other disposal of such artificial limbs or appliances without the authority of the Minister; to forbid any false statement, suggestion or representation with respect to any artificial limbs, appliances or other goods manufactured in or for or issued from the Department;

"(*d*) For the disposal of any moneys payable by the Crown to the estates of deceased or insane officers, soldiers or other persons, or any properties or moneys in the possession or control of the Department belonging to such officers, soldiers or other persons, or otherwise;

"(*e*) For prescribing the payments, grants or allowances, if any, to be made to persons or their dependents whenever such persons are being cared for under the provisions of this Act, either by medical treatment, training or otherwise;

"(*f*) With respect to reciprocal or other arrangements with the Government of the United Kingdom of Great Britain and Ireland, or the Government of any British Dominion or the Government of any of His Majesty's allies in the said war, or the Government of the United States of America, for the treatment, care and training and the issue of payments, grants or allowances to persons who have

served in the forces of any such Government when cared for under the provisions of this Act, either by medical treatment, training or otherwise, or to their dependents;

"(*g*) For the purpose of carrying out the provisions of this Act, with respect to any matter placed under the control and management of the Minister; and

"(*h*) For imposing penalties not exceeding in any case a fine of two hundred dollars or imprisonment for a term not exceeding three months enforceable upon summary conviction for the violation of any provision of any such regulation;

"(*i*) All regulations made hereunder approved by the Governor in Council shall be laid before Parliament within fifteen days after they are made if Parliament is then sitting, and if not, then within fifteen days after the opening of the next session of Parliament.

"(3) Nothing in this Act shall be deemed in any way to affect the powers or duties of the Board of Pension Commissioners for Canada, or the Soldier Settlement Board."

APPENDIX VII.

Re-enactment under the Department of Soldiers' Civil Re-establishment Act, 1919, of certain Orders in Council passed under the authority of the War Measures Act, 1914.

P.C. 2324.

AT THE GOVERNMENT HOUSE AT OTTAWA.

FRIDAY, the 21st day of November, 1919.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

Whereas under and by virtue of the authority conferred by the War Measures Act, 1914, certain Orders in Council, relating to the treatment, training and re-establishment in civil life of ex-members of His Majesty's Forces, were enacted;

And whereas the Minister of Soldiers' Civil Re-establishment reports that in order to enable the Department of Soldiers' Civil Re-establishment properly to provide medical treatment, vocational training and other benefits for ex-members of the forces, it is necessary that the said Orders in Council be continued in full force and effect;

Therefore His Excellency the Governor General in Council is pleased to order and doth hereby order and declare that the provisions of the Orders in Council hereinafter mentioned, shall hereafter be in full force and effect subject to the amendments hereinafter set forth, and shall be regarded as having been made effective by virtue of the authority conferred by the Department of Soldiers' Civil Re-establishment Amendment Act, 1919, instead of by virtue of the War Measures Act, 1914, viz.:—

P.C. 2039, dated 22nd August, 1918, subject to the amendment of clause 1 (*c*) by striking out the words "four months' imprisonment" and substituting therefor the words "three months' imprisonment."

P.C. 1993, dated 28th September, 1918.

P.C. 2418, dated 28th September, 1918.

P.C. 387, dated 24th February, 1919, as amended by P.C. 804, dated 12th April, 1919.

P.C. 424, dated 3rd March, 1919.

P.C. 814, dated 16th April, 1919.

P.C. 1040, dated 19th May, 1919, as amended by P.C. 1845, dated 10th September, 1919, and as further amended by P.C. 2131, dated 16th October, 1919.

P.C. 1342, dated 1st July, 1919.

P.C. 1742, dated 23rd August, 1919.

P.C. 1846, dated 10th September, 1919.

P.C. 2025, dated 30th September, 1919.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

APPENDIX VIII.

Order in Council (P.C. 387) dated the 24th February, 1919, as amended by Order in Council (P.C. 804), dated the 12th April, 1919.*—Authority under which the Department of Soldiers' Civil Re-establishment may carry on certain work and may grant allowances to men undergoing treatment or training.

Order in Council (P.C. 387) dated the 24th February, 1919, as amended by Order in Council (P.C. 804), dated the 12th April, 1919.

Whereas the Minister of Soldiers' Civil Re-establishment reports:—

That under Order in Council (P.C. 1366) dated June 22, 1918, certain powers were conferred upon the Department of Soldiers' Civil Re-establishment in respect to former members of the Naval and Military Forces of Canada, His Majesty's Forces other than those of Canada, and His Majesty's Allies in the present War.

That experience has shown that it is necessary to modify certain of these powers, and to extend others.

That the question of providing re-treatment for former members of the forces in cases where the disability is not clearly due to service, has been considered by the Department, and the following ruling has been made:—

> "When any ex-soldier applies for re-treatment, and it is questionable whether his disability is due to, or aggravated by service, the Unit Medical Director should give the ex-soldier the benefit of the doubt, if in his opinion, the general resistive power of the ex-soldier against disease has been lowered by war service to such a degree that it has induced the disability from which he suffers when he presents himself for re-treatment."

That on the return of a member of the Forces from overseas, it has been found in many cases that there is a lowered physical resistance, which sometimes results in a disability not directly attributable to war service, but which undoubtedly is indirectly caused thereby. It is considered that this lowered resistance will prevail for some time after the retirement or discharge of the former member of the Forces and that the Department should be empowered to grant treatment and medicines only, to all former members of the Forces who fall ill during the twelve months following the date of their retirement or discharge, when such treatment or medicine is not necessitated by a war disability.

That it may be pointed out that in Great Britain, either through the Ministry of Pensions or through National Health Insurance, provision is made for the grant of free treatment for all disabilities, when such incapacitate a man for work.

And whereas it is expedient to authorize the Department of Soldiers' Civil Re-establishment, hereinafter called the Department, as hereinafter set forth, such authority to supersede the authority granted under the Order in Council (P.C. 1366) dated June 22, 1918;

Therefore, His Excellency the Governor General in Council, under the powers vested in His Excellency by the War Measures Act, 1914, or by any other enabling authority, is pleased to order and it is hereby ordered as follows:—

* Re-enacted by Order in Council P.C. 2324, dated 21st November, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

Treatment and Training—Persons eligible for.

1. The provisions of the Order in Council of the 21st February, 1918 (P.C. 432), with respect to treatment and training, shall extend and apply to all persons who have served in the Canadian Naval or Military Forces of His Majesty during the present war and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada, and may in the discretion of the Department be extended to all persons who have served in the Naval or Military Forces of His Majesty or any of His Majesty's Allies, during the present war and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada and who were bona fide resident in Canada at the outbreak of the present war (hereinafter referred to as former members of the Forces), subject as follows:—

(*a*) Any former member of the Forces suffering from a disability, which in the opinion of a naval or military medical board or of a medical officer of the Department, is due to or was aggravated by service, and which disability in the opinion of such Board or officer prevents such former member of the Forces from obtaining or continuing employment, shall be entitled to medical or surgical treatment and to such allowances as are provided herein for former members of the Forces suffering from a disability preventing employment.

(*b*) Any former member of the Forces resident in Canada who, within twelve (12) months after retirement or discharge from the forces or if he has been transferred to the Department by the Department of Militia and Defence, or the Department of the Naval Service, for further continuance of treatment, within twelve (12) months of the completion of such treatment, requires medical or surgical treatment for a disability which is not due to or aggravated by service, shall be entitled to such medical or surgical treatment, provided that such disability is not due to vice or misconduct on the part of such former member of the Forces, and that it shall be competent for a medical officer of the Department to decide whether such disability is or is not due to such vice or misconduct; and provided also that the granting of such treatment shall not entitle such former member of the forces to receive pay and allowances from the Department, nor shall it be deemed in any way to entitle him to pension in respect of any disability not due to or aggravated by service.

(*c*) Any former member of the Forces suffering from a disability which in the opinion of a naval or military medical board, or of a medical officer of the Department is due to or was aggravated by service, and which in the opinion of the Director of Vocational Training of the Department prevents such former member of the Forces from returning to his previous trade or principal occupation, shall be entitled to re-training for a new occupation in accordance with the regulations of the Department, and to such allowances as are provided herein for former members of the Forces undergoing re-training.

Treatment and Training provisions of

2. The Department may, from time to time, and in its discretion, make arrangements through the Officer Paying Imperial Pensions at Ottawa, or with the Government of any of His Majesty's Domin-

ions for the treatment and training of all persons who have served in the Naval and Military Forces of His Majesty other than those of the Canadian Forces during the present war, and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada, whether bona fide resident in Canada at the outbreak of the present war or not, and may render accounts for the cost of such treatment or training and may, subject to such arrangements, and to the provisions of Clause 1, during the period of such treatment or training pay such persons and their dependents the allowances hereinafter set out.

H.M. Forces other than Canadian.

3. The Department may, from time to time, and in its discretion, make arrangements for the treatment and training of all persons who have served in the Canadian Naval and Military Forces of His Majesty during the present war, and who have been retired or discharged therefrom and who may now or hereafter be stationed or resident outside of Canada, and may pay the cost of such treatment or training and may, subject to such arrangements and to the provisions of Clause 1, during the period of such treatment or training, pay such persons and their dependents the allowances hereinafter set out.

Treatment and Training arrangements for ex-members C.E.F., outside of Canada

4. The Department, with the approval of the Governor in Council, may from time to time, and in its discretion make arrangements with the Governments of His Majesty's Allies for the treatment and training of all persons who have served in the Naval or Military Forces of His Majesty's Allies during the present war, and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada, whether bona fide resident in Canada at the outbreak of the present war or not, and may render accounts for the cost of such treatment or training and may, subject to such arrangements and to the provisions of Clause 1, during the period of such treatment or training pay such persons and their dependents the allowances hereinafter set out.

Treatment and Training provisions regarding ex-members, Allied Forces.

5. The allowances payable while he is undergoing training by the Department, for a former member of the Forces who is without dependents shall be sixty dollars ($60) a month.

Training allowances to men without dependents.

6. The allowances payable while he is undergoing training by the Department, for a former member of the Forces, who has neither a wife nor any children, but who has a person or persons partially dependent upon him, shall be sixty dollars per month, and the Department may in its discretion pay to such partially dependent person or persons such allowances as may, in the opinion of the Department, be deemed necessary, provided that the total allowances paid to or on account of such partially dependent person or persons shall not exceed an amount of twenty-five dollars ($25) per month.

Training allowances to men with partial dependents.

7. The allowances payable, while he is undergoing training by the Department, for a former member of the Forces, who has a wife,

Training allowances to married men.

or a wife and child, or a wife and children, and for such dependent or dependents, shall be as follows:—

(*a*) for such former member of the Forces.. ..	$85 00	a month.
(*b*) for one child..	10 00	"
(*c*) for two children..	18 00	"
(*d*) for three children..	25 00	"
(*e*) for more than three children $25 per month, plus $6 per month for each child in excess of three.		

Provided that the Department shall pay direct to the wife the sum of $40 out of the amount payable to the former member of the Forces plus the allowances for children.

Training allowances to widowers with children.

8. The allowances payable, while he is undergoing training by the Department, for a former member of the Forces who is a widower with a child or children and for such dependent or dependents, shall be as follows:—

(*a*) for such former member of the Forces and one child, an amount not exceeding $80 a month.

(*b*) for such former member of the Forces and two children, an amount not exceeding $88 a month.

(*c*) for such former member of the Forces and three children, an amount not exceeding $95 a month.

(*d*) for such former member of the Forces and more than three children, $95 per month plus $6 per month for each child in excess of three.

Provided that the Department may in its discretion pay to a guardian or other person having charge of any such child or children, such portion of the amounts set forth in this Clause as it may deem necessary and may deduct the amount so paid from the allowances payable to the former member of the Forces.

Training allowances to men with dependents other wife and children.

9. The allowances payable, while he is undergoing training by the Department, for a former member of the Forces who has neither a wife nor any children, but who has a parent or parents, or a person or persons in the place of a parent or parents, or a brother or a sister or brothers or sisters, any of whom are wholly or mainly dependent upon him for support, and for such dependent or dependents shall be as follows:—

(*a*) for such former member of the Forces.. ..	$60 00	a month.
(*b*) for such parent, an amount not exceeding..	25 00	"
(*c*) for such parent and one such brother or sister an amount not exceeding..	35 00	"
(*d*) for such parent and two such brothers or sisters, an amount not exceeding... ..	43 00	"
(*e*) for such parent and three such brothers or sisters, an amount not exceeding.. ..	50 00	"
(*f*) for such parent and more than three such brothers or sisters, $50 per month, plus $6 per month for each of such brothers or sisters in excess of three.		
(*g*) for one such orphan brother or sister an amount not exceeding..	20 00	"
(*h*) for two such orphan brothers or sisters an amount not exceeding..	28 00	"
(*i*) for three such orphan brothers or sisters, an amount not exceeding..	35 00	
(*j*) for more than three such orphan brothers or sisters, $35 per month, plus $6 per month for each of such orphan brothers or sisters in excess of three.		

Provided that if such former member of the Forces has two parents wholly or mainly dependent upon him for support, one of them shall, for the purpose of estimating the allowances payable in respect of such dependents be regarded as a brother or sister.

Training allowances are maximum.

10. The allowances set out in Clauses (8) and (9) for children of widowers or for parents, or for brothers or sisters, shall, subject to the provisions of Clause 13 be the maximum allowances payable for such dependents, but if, in the discretion of the Department, less amounts are sufficient for the maintenance of such persons, the Department may award such less amounts.

Training limitation of payment under one clause only—what children may be included.

11. No allowances shall be payable, while he is undergoing training by the Department, for a former member of the Forces or for his dependent or dependents under more than one of Clauses (5), (6), (7), (8) and (9) but any person or persons to whom a former member of the Forces who is undergoing treatment or training by the Department stands in loco parentis shall, at the discretion of the Department for the purpose of estimating the allowances payable to such former member of the Forces and for such dependent or dependents, be regarded as his child or children.

Treatment and Training—Limitation of dependents Department to decide dependency.

12. No allowances shall be payable, while he is undergoing treatment or training by the Department, for any dependent or dependents of a former member of the Forces other than those mentioned in Clauses (6), (7), (8), (9) and (11), and the decision whether or not a person is dependent upon a former member of the Forces shall rest with the Department, and any allegation of dependency shall be corroborated by such evidence as may from time to time be required by the Department.

Training deduction for subsistence.

13. (*a*) In cases where a former member of the Forces while undergoing training by the Department is subsisted by the Department the sum of $30 per month (to cover cost of such subsistence) shall be deducted from the Pay and Allowances of such former member of the Forces, provided that when such former member of the Forces has a dependent or dependents for whom allowances are payable under this Order in Council, and with whom he is residing at the commencement of his training by the Department and owing, to his undergoing training is unable to continue to reside with such dependent or dependents, or finds it necessary, with the approval of the Department to remove such dependent or dependents to another place of residence, the sum of twenty-two dollars only shall be deducted, and the allowances payable to or on account of such dependent or dependents may in the discretion of the Department be increased by $8 per month.

Training—Additional allowances in special cases.

(*b*) In cases where a former member of the Forces who while undergoing training is not subsisted by the Department, and who has a dependent or dependents for whom allowances are payable under this Order in Council with whom he was residing at the commencement of his training, is, owing to his undergoing training, unable to continue to reside with such dependent or dependents, or, finds it necessary, with the approval of the Department to remove such dependent or dependents to another place in order to continue

to reside with them, the allowances payable for such former member of the Forces under this Order in Council shall be increased by an amount of eight dollars per month, and the allowances payable to or on account of such dependent or dependents shall also be increased by an amount of eight dollars a month.

Treatment and Training—Manner of payment.

14. The allowances payable, while he is undergoing treatment or training by the Department, for a former member of the Forces or for the wife of a former member of the Forces shall be paid direct to him or her unless in the discretion of the Department, it is deemed advisable to pay such allowances to such other person as the Department may determine, and the allowances payable, while he is undergoing treatment or training by the Department, for the dependent or dependents of a former member of the Forces other than his wife, shall be paid to such person as the Department may determine.

Training—Men married during.

15. If a former member of the Forces is unmarried or a widower at the time his training is approved by the Department and marries during the progress of his training, the allowances for a married former member of the Forces, shall be paid to him from the date of his marriage, or in the event of the interruption of his training on account of his marriage, from the date of the resumption of his training instead of the allowances he or his dependents, if any, were receiving prior to his marriage.

Treatment—Pay and allowances and allowance in lieu of Patriotic Fund.

16. (*a*) The allowances payable while he is undergoing treatment by the Department for a former member of the Forces passed immediately on discharge by the Department of Militia and Defence, or by the Department of the Naval Service to the Department for further treatment which prevents him from obtaining employment and for a former member of the Forces who is accepted by the Department for treatment for a recurrence of disability due to or aggravated by service which prevents him from obtaining or continuing employment and for his dependent or dependents shall be equivalent to the amount of the pay and allowances paid by the Department of Militia and Defence or by the Department of the Naval Service, for the rank held by the former member of the Forces at the time of his retirement or discharge less subsistence allowance but with the addition of the following allowances for the dependent or dependents of such former member of the Forces who held a rank below commissioned rank in lieu of the Patriotic Fund Allowance if such dependents are residing in Canada.

Wife only	$10 00	per month.
Wife and one child	19 00	"
Wife and two children	26 00	"
Wife and three children	31 00	"

For each child in excess of three children, $5 per month with a maximum allowance of $45 per month for wife and children.

Provided that the allowance in lieu of Patriotic Fund Allowances or such lesser amounts as may be determined by the Department, may be payable to, or in respect of other dependents of a former member of the forces below commissioned rank, than a wife

or children if such dependents would be entitled to the same had the former member of the forces been re-attested as a member of the Forces.

(*b*) There shall be deducted from the allowances payable to such former member of the Forces the sum of twenty dollars per month or such sum as he had while on active service assigned to his dependent or dependents whichever be the greater, and this sum together with an amount equivalent to the amount of separation allowance to which, but for his retirement or discharge, he would be entitled under the pay and allowance regulations of the Department of Militia and Defence or the Department of the Naval Service, shall, subject to Clause 14 hereof, be paid direct to such dependent or dependents.

(*c*) In the event of such former member of the Forces being granted out-patient treatment provided that in the opinion of the Department his disability is such as to prevent him from obtaining or continuing employment, there shall be added to the allowances payable to him under the authority of this clause, an amount equivalent to the subsistence allowance to which, but for his retirement or discharge he would have been entitled under the pay and allowance regulations of the Department of Militia and Defence or the Department of the Naval Service.

(*d*) No former member of the Forces, who is undergoing in-patient treatment by the Department and is entitled to the allowances payable under this clause, shall unless specially authorized by the Department be paid, for his personal use, a larger sum than $10 per month, out of such allowances and the balance of his allowances shall be retained by the Department to his credit and paid to him on the conclusion of his treatment.

Treatment allowances for men called in for medical examination and renewals orthopaedic appliances.

17. (*a*) When a former member of the Forces not in receipt of allowances under any of clauses 6, 7, 8, 9 or 16 is directed by an officer of the Department, or by a medical practitioner, acting under the authority of the Department, to report at an institution for examination or observation or for treatment for a period not exceeding one week or when a former member of the Forces is directed by an Officer of the Department authorized in that behalf to report to an institution or other place for repairs to or replacement of an artificial limb or other orthopaedic appliance provided that the time occupied shall not be longer than fourteen days, he shall be entitled to receive the following allowances:—

Return transportation, first class, with sleeping berths, if necessary, $1 per day for the time absent from his home plus $1.50 for every night, spent at a hotel or lodgings at his own expense, and 50 cents for every meal (3 meals a day) purchased by him, while absent from home.

(*b*) When the institution or other place to which such former member of the Forces, not undergoing treatment or training is required to report is in the same town as, or contiguous to his place of residence, he shall be paid at the rate of $3 per day, in lieu of the allowances set forth in section (*a*) of this clause provided that the time occupied shall not be longer than fourteen days.

(*c*) When it is necessary for a former member of the Forces not in receipt of allowances under any of Clauses 6, 7, 8, 9 or 16 to remain at an institution for observation or for repairs to his artificial limb or other orthopaedic appliance or should the repairs to his artificial limb or other orthopaedic appliance take such time as to keep him from his home or prevent him following any remunerative occupation for longer than fourteen days he shall after the fourteenth day be paid the allowances set forth in clause (16) hereof, less the amount of pension, if any, paid to or in respect of himself or his dependents.

(*d*) When a former member of the Forces who is undergoing training is directed by an Officer of the Department to report at an institution or other place for examination or for treatment or for repairs to or replacement of an artificial limb or other orthopaedic appliance, his allowances, subject to Clause 21, shall continue and he shall not be entitled to receive the allowances set forth in subsections A and B of this clause, but any reasonable expenses which he may incur shall be paid by the Department provided that such expenses were authorized and approved by an Officer of the Department authorized in that behalf prior to their being incurred.

Treatment—Out-patients Class 2.

18. When a former member of the Forces not in receipt of allowances under any of Clauses 6, 7, 8, 9 or 16, whose disability does not prevent him from obtaining or continuing employment, requires out-patient treatment, he shall be entitled to receive such treatment from the Department and to receive such medicine, as he may need. He shall not be entitled to receive the allowances set forth in clause 16 hereof, but if attendance for such treatment or medicine causes such former member of the forces a monetary loss he shall be entitled in the discretion of the Department, to be reimbursed for such loss provided that the amount shall not exceed one dollar ($1) for each attendance for treatment together with reasonable travelling expenses.

Training—Stoppage and continuation of pension.

19. When a former member of the Forces commences training by the Department, no further payment or payments of pension and allowances by the Board of Pension Commissioners or the Pension and Claims Board other than the payment or payments of such pension and allowances to the date of the commencement of training shall be made to such former member of the Forces, and the allowances payable under the authority of this Order in Council shall commence from the date of such commencement of training, provided that if a payment or payments of pension is or are received by a man during his period of training, the Department shall have authority to deduct the amount of such payment under the authority of this Order in Council, and provided also that at the conclusion of his training by the Department, the Board of Pension Commissioners shall continue pension allowance or gratuity, if any, at such rate as they may then determine as from the day following the day on which the training of such former member of the Forces was concluded.

Treatment—Pension to continue.

20. When a former member of the Forces is accepted for treatment by the Department and is entitled to the allowances set forth in clause 16 hereof, there shall be deducted from each payment of such allowances the amount of pension, if any, to which he or his dependents may be entitled from the Board of Pension Commissioners or the Pension and Claims Board for the period for which he is undergoing treatment, such deduction being made from the amounts payable to the man himself or his dependents, or both, in the discretion of the Department, provided that if the amount of pension is higher than the allowances under clause 16 hereof, pension shall continue and no payment of allowances shall be made by the Department.

Treatment and Training institutional treatment for men undergoing training.

21. If a former member of the Forces who is undergoing training by the Department requires institutional treatment during the period of his training, his training allowances and the allowances of his dependent or dependents shall continue during the period of such institutional treatment, provided that the payment of such allowances by the Department during the period of such treatment shall be suspended if the treatment is made necessary by misconduct, provided also that at any time the former member of the forces may be transferred from training allowances to treatment allowances at the discretion of the Department.

Treatment—Men refusing to undergo treatment, misconduct.

22. If a Naval or Military Medical Board or a Medical Officer of the Department reports that a former member of the Forces shall undergo treatment, and such former member of the Forces unreasonably refuses to undergo such treatment or if by any reason of the misconduct of such former member of the forces while undergoing treatment it is necessary in the discretion of the Department to discontinue such treatment, the pension to which he or his dependents would otherwise be entitled may, in the discretion of the Board of Pension Commissioners for Canada, be reduced or refused and any Post Discharge Pay or War Service Gratuity to which such former member of the Forces and his dependents at the time such report is received, or such treatment is discontinued by the Department may be entitled, may be withheld until the Department has certified to the Officer *i. e.* of Post Discharge Pay that such former member of the Forces has undergone and completed to the satisfaction of the Department the treatment so recommended or that such misconduct has been excused. The decision as to what under the provision of this Clause constitutes unreasonable refusal or misconduct shall rest with the Department and its decision shall be final.

Treatment and Training—Post-treatment and training allowances.

23. (1) The payment of allowances authorized by this Order in Council may be continued for one month after the completion of training of a former member of the Forces provided that (*a*) In the opinion of the Department his conduct while undergoing training has been satisfactory; (*b*) his training has occupied a longer period than two months; (*c*) In the opinion of the Department such continuation of payment is necessary to assist him in obtaining employment or to tide him over a period of temporary difficulty.

(2) The payment of allowances authorized by this Order in Council may be continued for one month after the completion of

treatment of a former member of the Forces, provided that (*a*) In the opinion of the Department his conduct, while undergoing treatment, has been satisfactory (*b*) his treatment has occupied a longer period than two months (*c*) he is not entitled to any payment of War Service Gratuity (*d*) in the opinion of the Department such continuation of payment is necessary to assist him in obtaining employment or to tide him over a period of temporary difficulty.

Department's requirements to be observed in discharges.

24. In carrying out the retirement or discharge of any person who has served in the Canadian Naval or Military Forces of His Majesty during the present war the requirements of the Department of Soldiers' Civil Re-Establishment shall so far as possible be complied with.

Treatment and Training— Department's disciplinary powers and regulations.

25. The Department shall have power to make regulations respecting the administration and discipline of, and allowances payable for, a former member of the Forces while undergoing treatment or training by the Department and the allowances payable for his dependent or dependents and all deductions from or cancellations of such allowances for the purpose of discipline, and to require that before becoming entitled to treatment or training by the Department, a former member of the Forces shall sign a document agreeing while undergoing treatment or training to submit to all such regulations.

Treatment and Training— Age limit child dependents.

26. No allowances shall be paid under authority of this Order in Council for any child or brother or sister of any former member of the Forces who, if a boy is over the age of 16, or, if a girl, is over the age of 17 years, provided that if the child or brother or sister is unable owing to physical or mental infirmity to provide for its maintenance the allowances may be continued until such child or brother or sister has attained the age of 21 years. Provided also that no allowances shall be paid in respect of a child or brother or sister after the marriage of such child or brother or sister.

Cancellation of previous Orders in Council.

27. The provisions of the Order in Council, P.C. 1366, dated the 22nd June, 1918, are hereby rescinded as from the first day of March, 1919, but the allowances which at the date of this Order in Council are being paid under the provisions of P.C. 976, dated the 12th April, 1917, to a former member of the Forces undergoing training and to his dependent or dependents may in the discretion of the Department continue to be paid until his training has been completed.

Treatment and Training— Departmental decision final.

28. The decision of a Naval or Military Medical Board or of a medical officer of the Department under the provisions of clause (1), and the decision of the Department under the provisions of clauses (1), (6), (10), (11), (12), (13), (14), (16), (18), (20), (21), (22), (23), (27), (29) and (30), and the decision of the Board of Pension Commissioners for Canada under the provisions of clause (22), shall be final.

Insane former members of the Forces.

29. The provisions of this Order in Council shall not apply to any former member of the Forces who is certified by a Naval or Military Medical Board or a Medical Officer of the Department to be insane, provided that an out-patient of a Hospital for the Insane may in the discretion of the Department be paid the allowances set forth in clause 16 hereof.

Treatment and Training to whom Order in Council does not apply.

30. The provisions of this Order in Council and of the Order in Council of the 21st February, 1918, (P.C. 432), shall not unless the Department otherwise directs, extend and apply to any person who has served in the Naval and Military Forces of His Majesty during the present war who,—

(*a*) has been cashiered or dismissed the service by sentence of court martial;

(*b*) has been deprived of his commission or warrant by reason of misconduct;

(*c*) has been called upon to retire or to resign his commission or warrant by reason of misconduct;

(*d*) has been discharged having been sentenced to be discharged with ignominy, or in the Naval Forces with or without disgrace;

(*e*) has been discharged having been sentenced to penal servitude or having been sentenced by court martial to imprisonment for two years or more.

(*f*) has been discharged during his service having been convicted by the civil power of an offence punishable by imprisonment for more than two years committed either before or after enlistment, or

(*g*) has been discharged for misconduct, or to any person who has served in the Naval or Military Forces of any of His Majesty's Allies during the present war, who has been retired or discharged on any like ground.

31. The provisions of this Order in Council shall be operative from the 1st day of March, 1919, and the allowances hereby authorized shall continue until the Governor in Council shall by Order in Council otherwise provide, provided that the provisions of subsection 1 of clause 23 shall be made retroactive to the 1st July, 1918.

RODOLPHE BOUDREAU,

Clerk of the Privy Council.

APPENDIX IX.

Authority under which the Department of Soldiers' Civil Re-establishment may deal with insane ex-members of the Forces.

P.C. 1993.

AT THE GOVERNMENT HOUSE AT OTTAWA.

SATURDAY, the 28th day of September, 1918.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

Whereas by Bill 12, introduced in the 1st Session, 13th Parliament, 8-9 George V, 1918, entitled "An Act respecting the Department of Soldiers' Civil Re-establishment,"

> "the management and control of all matters relating to the re-establishment in civil life and activities of all persons who have served in the naval or military forces of His Majesty or any of His Majesty's Allies during the present war and the dependents of such persons, and the administration of any statutes or of any regulations or orders enacted or made by the Governor in Council for such purpose;"

was conferred upon the Minister of Soldiers' Civil Re-establishment;

And whereas under Order in Council of the 21st February, 1918 (P.C. 433) the Invalided Soldiers' Commission, then known as the Military Hospitals Commission, now a Branch of the Department of Soldiers' Civil Re-establishment, was charged with the care and treatment of former members of the Canadian Expeditionary Force suffering from insanity or who are mentally deficient;

And whereas by Order in Council, P.C. 3433, dated the 22nd December, 1917, regulations were made regarding the treatment and care of members of the Canadian Expeditionary Force who had become insane during, or as a result of, military service;

And whereas by P.C. 462, dated 2nd March, 1918, regulations were made regarding the treatment and care of insane officers and men of the Naval Service who had become insane during, or as a result of, their service with the Department of Naval Service;

And whereas owing to the re-organization of the Invalided Soldiers' Commission under the Department of Soldiers' Civil Re-establishment, and the regulations now in force that members of the Canadian Expeditionary Force who are found to be mentally deficient or insane should be retired or discharged from such force as soon as practicable after their return from overseas or after their condition has been diagnosed;

Therefore His Excellency the Governor General in Council, on the recommendation of the Minister of Soldiers' Civil Re-establishment, is pleased to order as follows:—

The Orders in Council, P.C. 3433, dated the 22nd day of December, 1917, and P.C. 462, dated the 2nd day of March, 1918, are hereby rescinded and the following substituted therefor:—

1. Whenever the term "former member of the forces" is used herein it shall apply to all persons who have served in the Canadian Naval or Military

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

Forces of His Majesty during the present war and who have been retired or discharged therefrom, and who may now or hereafter be resident in Canada, and whenever the term "dependents" is used it shall apply only to such persons as are classed as dependents under the authority granted to the Board of Pension Commissioners for Canada.

2. Insane members of the Canadian Naval and Military Forces shall be retired or discharged from the Naval or Military Forces as soon as possible after their return from overseas or after their condition has been diagnosed and shall, subject to arrangements with the Department of Soldiers' Civil Re-establishment, and at its option, be sent to an institution operated by that Department or to a provincial hospital for the insane in the province in which they were domiciled before enlistment, the Department of Soldiers' Civil Re-establishment being immediately notified as to disposition made of such former members of the forces.

3. The Department of Soldiers' Civil Re-establishment shall have authority to operate such hospitals for the insane as may be deemed necessary and may make such arrangements with the Provincial Governments for the care and treatment of insane former members of the forces in provincial hospitals for the insane, as may be necessary.

4. Former members of the forces who are insane may be divided into three classes as follows:—

A.—Retired or discharged owing to insanity entirely caused by service;

B.—Retired or discharged, owing to insanity only partially caused by service; and

C.—Retired or discharged owing to insanity not in any way caused by service.

Each of these classes may be sub-divided as follows:—

(1) With dependents.

(2) Without dependents.

Class A.—Former members of the forces retired or discharged owing to insanity entirely caused by service.

(1) With dependents: (*a*) The former member of the forces shall be maintained by the Department of Soldiers' Civil Re-establishment. (*b*) His dependents shall be paid by the Department of Soldiers' Civil Re-establishment a sum equal to the amount of pension which would be payable to them if he had died on active service. (*c*) Should he recover he may, in the discretion of the Department of Soldiers' Civil Re-Establishment, be paid, either in one sum or spread over a period, a sum not exceeding one hundred dollars ($100) per year for the period he has been under the care of that Department.

(2) Without dependents: (*a*) The former member of the forces shall be maintained by the Department of Soldiers' Civil Re-establishment. (*b*) Should he recover he may, in the discretion of the Department of Soldiers' Civil Re-establishment, be paid, either in one sum or spread over a period, a sum not exceeding one hundred dollars ($100) per year for the period he has been under the care of that Department.

Class B.—Former members of the forces retired or discharged owing to insanity only partially caused by service (in this class the word "dependents" shall mean only those proving actually need and dependency).

(1) With dependents: (*a*) The former member of the forces shall be maintained by the Department of Soldiers' Civil Re-establishment. (*b*) His dependents shall be paid by the Department of Soldiers' Civil Re-establishment a sum

equal to the amount of pension which would be payable to them if he had died on active service. (*c*) If his insanity is certified by a Board of Medical Officers of the Department of Soldiers' Civil Re-establishment as being more than 80 per cent caused by service he may, in the discretion of the Department of Soldiers' Civil Re-establishment, be paid, should he recover, either in one sum or spread over a period, an amount not exceeding twenty-five dollars ($25) per year for each full 5 per cent of his certified disability over 80 per cent for the period he has been under the care of that Department.

(2) Without dependents: (*a*) The former member of the forces shall be maintained by the Department of Soldiers' Civil Re-establishment. (*b*) If his insanity is certified by a Board of Medical Officers of the Department of Soldiers' Civil Re-establishment as being more than 80 per cent caused by service he may, in the discretion of the Department of Soldiers' Civil Re-establishment, be paid, should he recover, either in one sum or spread over a period, an amount not exceeding twenty-five dollars ($25) per year for each full 5 per cent of his certified disability over 80 per cent for the period he has been under the care of that Department.

Class C.—Former members of the forces retired or discharged owing to insanity not in any way caused by service.

The former member of the forces shall be maintained by the Department of Soldiers' Civil Re-establishment. No allowances shall be paid to his dependents, if any, and no amount shall be paid to him should he recover.

5. If a legal guardian or curator has been appointed to administer the affairs of an insane former member of the forces and the Department of Soldiers' Civil Re-Establishment has been relieved of responsibility for his care and maintenance, he shall be awarded a pension by the Board of Pension Commissioners for Canada commencing on the day following the day on which the Department of Soldiers' Civil Re-establishment has ceased to maintain and care for him, and the whole of such pension shall be paid by the Board of Pension Commissioners to such guardian or curator provided that in the discretion of the Board of Pension Commissioners the whole of such pension may be paid to a person who has not been appointed legal guardian or curator, but who has been appointed administrator.

6. (*a*)When a former member of the forces who has been undergoing treatment in a hospital for the insane under the Department of Soldiers' Civil Re-establishment has recovered sufficiently to be allowed to pass under his own control, the local representative of that Department shall forward to the Board of Pension Commissioners the proceedings of the Board of Medical Officers certifying to such recovery, and the Board of Pension Commissioners shall then award pension, allowance or gratuity, if any, to commence on the day following the day of the release by the Department of Soldiers' Civil Re-establishment of such former member of the forces. (*b*) The amount, if any, standing to his credit on the books of the Department of Soldiers' Civil Re-establishment shall be paid to him.

7. (*a*) The pension granted to a former member of the forces at present undergoing treatment in a hospital for the insane shall at a date to be set by the Department of Soldiers' Civil Re-establishment be cancelled and the provisions of this Order in Council shall then apply to such former member of the forces and to his dependents, if any. (*b*) Any amount standing to the credit of such former member of the forces on the books of the Board of Pension Commissioners shall be transferred to his credit on the books at the head office of the Department of Soldiers' Civil Re-establishment.

8. The Department of Soldiers' Civil Re-establishment may from time to time, and in its discretion, make arrangements with the Governments of any of His Majesty's Dominions for the maintenance of insane persons who have served in the Naval and Military Forces of His Majesty other than those of the Canadian Forces during the present war and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada, whether *bona fide* residents in Canada at the outbreak of the present war or not, and may render accounts for such maintenance.

9. The Department of Soldiers' Civil Re-establishment, with the approval of the Governor in Council, may from time to time, and in its discretion, make arrangements with the Governments of His Majesty's Allies for the maintenance of insane persons who have served in the Naval or Military Forces of His Majesty's Allies and who have been retired or discharged therefrom and who may now or hereafter be resident in Canada, whether *bona fide* residents in Canada at the outbreak of the present war or not, and may render accounts for the cost of such maintenance.

10. The provisions of Order in Council P.C. 1366, dated the 22nd day of June, 1918, regarding pay and allowances of men undergoing treatment in hospitals under the Department of Soldiers' Civil Re-establishment shall not apply to former members of the forces who are undergoing treatment for insanity.

11. The Department of Soldiers' Civil Re-establishment may arrange with the superintendents of hospitals for the insane an allowance to be made to former members of the forces interned in such hospitals for the insane for the purpose of purchasing clothing, tobacco or other comforts, and the amount of such allowance shall be charged against the former member of the forces on the books of the Department of Soldiers' Civil Re-establishment and shall be deducted from any amounts payable to him should he recover, but in the event of his non-recovery it shall be written off.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

APPENDIX X.

Authority under which the Department of Soldiers' Civil Re-establishment may give vocational training and pay and allowances to men who enlisted under the Military Age of 18 years.

P.C. 814.*

Certified Copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 16th April, 1919.

The Committee of the Privy Council have had before them a report, dated 12th April, 1919, from the Minister of Soldiers' Civil Re-establishment, stating that the question of re-training men who have not been disabled has, for some time, been the subject of consideration and discussion by district vocational officers, secretaries of returned soldiers' commissions, presidents of universities, war veterans and others interested in the work of the rehabilitation of returned soldiers, and that it would appear desirable to provide re-training facilities for young men who have enlisted voluntarily in the forces under the military age of eighteen years. As they were immature at the time their decision was made, it has been urged that the public is responsible for any disadvantages accruing to them, owing to their having been accepted when under age. Being immature they could not rightly measure the consequences of their act, and the spirit of adventure had probably more to do with their enlisting than it had with older men.

A large number of these young men, if they had continued their work, would, in the course of time, have become skilled workmen and in a position of self support and independence, but the years they spent in the Army were just those during which they should have been fitting themselves to earn a livelihood in an occupation for which they had prepared themselves. It is difficult, and practically impossible for them to put themselves back in the same position.

It would be unfortunate if they were forced into the ranks of unskilled labour with an added handicap on account of the age at which they are starting. If, on the other hand, they could be trained under the guidance of competent instructors or in a carefully supervised industry, their experience in the war might be turned to advantage, both to themselves and the country.

It is desired that discretionary powers be granted to the Department to train these young men in industries, or in classes conducted by the Department and to pay such allowances as may be determined. It is probable that those apprenticed and taking training in industries will be paid in a manner different to those who are attending classes. It is suggested that where practicable, they be enrolled as apprentices in accredited industries, where they will receive the pay of apprentices from the industry, which pay may be augmented by the Department to an amount per month not exceeding the special scale hereinafter referred to.

To overcome any difficulties which may develop in the administration of the training of minors in industries, it is suggested that they should become the wards of the Department of Soldiers' Civil Re-establishment and be dealt with individually.

The Minister, therefore, recommends as follows:—

(*a*) That the Department of Soldiers' Civil Re-establishment be granted discretionary powers to select such returned soldiers as may appear to be eligible, who enlisted under the military age of eighteen, and who, because of the war, suffered a severe interruption to their training, and to grant such men a further period of training in one of the Department's training classes, in a high school, college, university, business college or industrial establishment.

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

(*b*) That allowances be granted to any such returned soldiers according to a special scale to be approved by the Department, sanctioned by Order in Council.

(*c*) That the Department be empowered to pay the allowances for such period as may be fixed by regulations approved by the Governor in Council.

(*d*) That the allowances payable to any such returned soldiers receiving wages or other payments from the proprietors of industries, in which they may be apprenticed, may be augmented by the Department up to an amount not exceeding the scale to be fixed by Order in Council.

(*e*) That the Department be authorized to hold back a portion of any allowance payable, and to pay same to the student at the conclusion of his course, or later, if in the discretion of the Department it is deemed advisable so to do.

The Committee concur in the foregoing recommendations, and submit the same for approval.

(Sgd.) RODOLPHE BOUDREAU.
Clerk of the Privy Council.

P.C. 1846.*

At the Government House at Ottawa.
WEDNESDAY, the 10th day of September, 1919.

PRESENT:

The Deputy Governor General in Council:

Whereas the Order in Council P.C. 814 of the 16th April, 1919, provides:—

"That the Department of Soldiers' Civil Re-establishment be granted discretionary powers to select such returned soldiers as may appear to be eligible who enlisted under the military age of eighteen, and who, because of the war suffered a severe interruption to their training, and to grant such men a further period of training in one of the Department's training classes, in a high school, college, university, business college or industrial establishment.

"That allowances be granted to any such returned soldiers according to a special scale to be approved by the Department, sanctioned by Order in Council."

Therefore the Deputy Governor General in Council in pursuance of the foregoing and on the recommendation of the Minister of Soldiers' Civil Re-establishment is pleased to order and it is hereby ordered as follows:—

(*a*) The Department of Soldiers' Civil Re-establishment is hereby authorized to pay to, or on account of, such returned soldiers as may be selected for re-training under the provisions of Order in Council P.C. 814 of the 16th April, 1919, the allowances authorized by Order in Council, P.C. 387 of the 24th February, 1919, clauses 5 to 15 inclusive, to be paid to, or on account of, all former members of the Forces while undergoing training by the Department;

(*b*) The allowances authorized by clause (*a*) hereof shall be the maximum allowances payable to, or on account of, former members of the Forces selected for training under the provisions of the said Order in Council, P.C. 814, of the 16th April, 1919.

(*c*) In cases where the payment of the allowances authorized by the foregoing clause (*a*) would not appear to be justified, the Department may in its discretion, pay such lesser allowances as may be warranted by the conditions under which training is provided.

(Sgd.) F. K. BENNETTS,
Asst. Clerk of the Privy Council.

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

APPENDIX XI.

Limitation of period during which application for retraining may be made by ex-members of the Forces entitled to the same.

P.C. 1040.*

Certified copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 19th May, 1919.

The Committee of the Privy Council have had before them a Report, dated 13th May, 1919, from the Minister of Soldiers' Civil Re-establishment, submitting that the Department of Soldiers' Civil Re-establishment has been granted authority from time to time to give retraining to members of the Canadian Expeditionary Force who have suffered disabilities as a result of service, which prevented them from returning to their previous occupation, or who, for other reasons, were considered eligible to receive such training at public expense. The number of men at present undergoing re-training is 6,989, and it is expected in the near future that this number will be augmented considerably.

The minister further submits that as the men for whom re-training has been provided will all shortly have been demobilized, a period should be set as to the time during which application can be made for a re-training course.

The minister, therefore, recommends as follows:—

> That no ex-members of the Canadian Naval or Military Forces shall be entitled to the benefits of retraining under the Department of Soldiers' Civil Re-establishment unless application for a course of retraining is made within 12 months from the date of the passing of this Order in Council, or 12 months from the date of retirement or discharge from the Naval or Military Forces, whichever is the later, provided that where an ex-member of the forces has been transferred or passed direct by the Department of Militia and Defence, or the Department of the Naval Service to the Department of Soldiers' Civil Re-establishment for a continuation of treatment such ex-member of the forces shall be allowed 6 months from the completion of such treatment in which to make application for and to commence his course.

The committee concur in the foregoing recommendation, and submit the same for approval.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

*Re-enacted, as amended by P.C. 1845, dated September 10, 1919 and as further amended by P.C. 2131, dated October 16, 1919,—by Order in Council P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

P.C. 1845.*

AT THE GOVERNMENT HOUSE AT OTTAWA.

WEDNESDAY, the 10th day of September, 1919.

PRESENT:

THE DEPUTY GOVERNOR IN COUNCIL.

Whereas it is provided by Order in Council P.C. 1040, dated 19th May, 1919:—

"That no ex-members of the Canadian Naval or Military Forces shall be entitled to the benefits of retraining under the Department of Soldiers' Civil Re-establishment unless application for a course of retraining is made within twelve months from the date of the passing of this Order in Council or twelve months from the date of retirement or discharge from the Naval or Military Forces whichever is the later, provided that where an ex-member of the Forces has been transferred or passed direct by the Department of Militia and Defence or the Department of the Naval Service to the Department of Soldiers' Civil Re-establishment for a continuation of treatment, such ex-member of the Forces shall be allowed six months from the completion of such treatment in which to make application for and to commence his course."

And whereas owing to the rapidity with which the demobilization of the Naval and Land Forces of Canada has been effected, the matter of further limiting the period during which disabled ex-members of the Forces may apply to the Department of Soldiers' Civil Re-establishment for the benefits of retraining has been the subject of further consideration;

And whereas it is considered to be in the interest of such disabled soldiers as are entitled to participate in the benefits of retraining that they take advantage of such benefits at the earliest possible date, with a view to effecting more quickly their re-establishment in civil life;

Therefore, the Deputy Governor General in Council, on the recommendation of the Minister of Soldiers' Civil Re-establishment, is pleased to order that the foregoing clause of the said Order in Council P.C. 1040, of the 19th May, 1919, shall be and the same is hereby amended by striking out all words after the word "That" in the first line thereof, and by substituting the following therefor:—

"No ex-members of the Canadian Naval or Military Forces shall be entitled to the benefits of retraining under the Department of Soldiers' Civil Re-establishment, unless application for courses of retraining is made within three months from the first day of September, 1919, or three months from the date of retirement or discharge from the Naval or Military Forces, whichever is the later, provided that where an ex-member of the Forces has been transferred or passed directly from the Department of Militia and Defence or the Department of the Naval Service to the Department of Soldiers' Civil Re-establishment for a continuation of treatment such ex-member of the Forces shall be allowed three months from the completion of such treatment in which to make application for the benefits of such retraining."

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

* Re-enacted, as amended by P.C. 2131, 16th October, 1919.—by Order in Council 2324, dated 21st November, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

P.C. 2131.*

AT THE GOVERNMENT HOUSE AT OTTAWA,

THURSDAY, the 16th day of October, 1919.

PRESENT:

THE DEPUTY GOVERNOR GENERAL IN COUNCIL.

Whereas it is provided by Order in Council dated 10th Sepetmber, 1919 (P.C. 1845),—

"That no ex-members of the Canadian Naval or Military Forces shall be entitled to the benefits of retraining under the Department of Soldiers' Civil Re-establishment, unless application for courses of retraining is made within three months from the first day of September, 1919, or three months from the date of retirement or discharge from the Naval or Military Forces, whichever is the later, provided that where an ex-member of the Forces has been transferred or passed directly from the Department of Militia and Defence or the Department of the Naval Service to the Department of Soldiers' Civil Re-establishment for a continuation of treatment such ex-member of the Forces shall be allowed three months from the completion of such treatment in which to make application for the benefits of such retraining."

And whereas the Minister of Soldiers' Civil Re-establishment recommends that the following paragraph be substituted for the above:

Therefore the Deputy Governor General in Council is pleased to order that the said Order in Council of the 10th September, 1919, shall be and the same is hereby amended by the substitution of the following paragraph for that quoted above, viz.:—

"That no ex-members of the Canadian Naval or Military Forces shall be entitled to the benefits of retraining under the Department of Soldiers' Civil Re-establishment, unless application for courses of retraining is made within three months from the publication of an announcement by the Department of Soldiers' Civil Re-establishment to this effect, or within three months from the 1st day of November, 1919, whichever is the earlier, provided that where the date of retirement or discharge of any ex-member of the Canadian Naval or Military Forces is subsequent to the 1st November, 1919, provided also that where an ex-member of the Forces has been transferred or passed directly from the Department of Militia and Defence or the Department of the Naval Service to the Department of Soldiers' Civil Re-establishment for a continuation of treatment such ex-member of the Forces shall be allowed three months from the date of retirement or discharge or from the completion of such treatment in which to make application for the benefits of such retraining."

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

APPENDIX XII.

Regulations for the Protection of Artificial Limbs, etc., Manufactured by the Department of Soldiers' Civil Re-Establishment.

P.C. 2039 (amended).*

AT THE GOVERNMENT HOUSE AT OTTAWA,

THURSDAY, the 22nd day of August, 1918.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

Whereas it is considered that in the public interest appropriate measures should be taken to secure the abatement of the practice by private concerns of inducing soldiers incapacitated by the loss of any of their limbs, to whom the Department of Soldiers' Civil Re-establishment has issued artificial limbs, to exchange such appliances for others manufactured or vended by them for which they exact, in addition to the transfer of the appliances so exchanged, a substantial money consideration; and to prevent any trading in the artificial limbs and appliances issued by the Department of Soldiers' Civil Re-establishment, except by and with the consent in writing of the Department.

Therefore His Excellency the Governor General in Council, on the recommendation of the Minister of Soldiers' Civil Re-establishment, and under and by virtue of the provisions of the War Measures Act, 1914, is pleased to make the following regulations, and the same are hereby made and enacted accordingly:—

1. (*a*) Every artificial limb or orthopædic or surgical appliance manufactured or issued by the Department of Soldiers' Civil Re-establishment shall, before it is issued to any person for use, be stamped or marked with a small seal bearing the words "Issued by the Government of Canada."

(*b*) Every person who wilfully defaces, conceals or removes the seal of the Government of Canada from any artificial limb or appliance issued by the Department of Soldiers' Civil Re-establishment shall be liable on summary conviction to a penalty not exceeding $100.

(*c*) Every person who, without lawful authority, makes or counterfeits such seal of the Government of Canada or the impression of such seal, or sells or exposes for sale or has in his possession any goods having thereon a counterfeit of any such seal, knowing the same to be a counterfeit, or affixes any such seal to any goods manufactured, sold or otherwise dealt with by such person, shall be guilty of an offence and liable on summary conviction to a fine of not more than $200 nor less than $50, or to three months' imprisonment with or without hard labour, and every chattel, article, instrument or thing by means of which or in relation to which the offence has been committed shall be forfeited.

2. No person to whom an artificial limb or appliance is issued by the Department of Soldiers' Civil Re-establishment shall transfer, exchange or otherwise relinquish the possession of such limb or appliance to any other person unless by and with the consent in writing of the Minister of Soldiers'

* Re-enacted as amended by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

Civil Re-establishment, and any person other than the person to whom such limb or appliance is so issued who has possession of any such limb or appliance or makes any alteration to the same without such consent shall be guilty of an offence and liable on summary conviction to a fine not exceeding $200, and such limb or appliance in his possession shall be confiscated and returned to the Department of Soldiers' Civil Re-establishment.

3. Every person who by words oral or written or by signs, pictures, caricatures or objects, or by public exhibition or demonstration, publishes a false statement or suggestion or representation disparaging any goods manufactured or issued by the Department of Soldiers' Civil Re-establishment shall be guilty of an offence and liable on summary conviction to a penalty not exceeding $100, provided that nothing in these regulations shall be deemed to take away or prejudice or otherwise affect any civil remedy which the Department might have for actionable disparagement of its goods.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

APPENDIX XIII.

Authority for the disposal of Estates of deceased ex-members of the Forces who die while on the strength of the Department of Soldiers' Civil Re-Establishment.

P.C. 2418.*

AT THE GOVERNMENT HOUSE AT OTTAWA.

SATURDAY, the 28th day of September, 1918.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

Whereas pursuant to the Regimental Debts Act, 1893, provision has been made in Canada for the administration of the military estates of deceased soldiers, and a director of military estates has been appointed with an adequate staff;

And whereas it is expedient that the estates of retired officers and discharged soldiers who, at the time of their deaths respectively, were in receipt of emoluments from the Department of Soldiers' Civil Re-Establishment (Invalided Soldiers' Commission), in the nature of emoluments in continuance of or in substitution for their pay and allowances as such officers and soldiers, should be dealt with in the same manner as if they had not been retired or discharged;

Therefore, His Excellency the Governor General in Council, on the recommendation of the Minister of Soldiers' Civil Re-Establishment, with the concurrence of the Minister of Militia and Defence, and in virtue of the powers conferred by the War Measures Act, 1914, and otherwise, is pleased to order and direct that the Regimental Debts Act, 1893, relating to the distribution of the estates of officers and soldiers, shall apply to the estates of retired officers and discharged soldiers who were at the time of their deaths respectively, in receipt of emoluments from the Department of Soldiers' Civil Re-Establishment (Invalided Soldiers' Commission), and that the estates of such deceased retired officers and discharged soldiers be distributed in all respects in the same manner and subject to the same provisions as it they had never been retired or discharged.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

APPENDIX XIV.

Arrangements with Government of Australia regarding the repatriation of Australians in Canada.

P.C. 1742.*

Certified copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 23rd August, 1919.

The Committee of the Privy Council have had before them a report, dated 9th August, 1919, from the Minister of Soldiers' Civil Re-Establishment stating that a communication has been received by cable from the Government of the Commonwealth of Australia in regard to the repatriation of Australians who served during the war with the Canadian Forces, reading as follows:—

> "Australians on active service with Canadian Forces during war eligible under Australian repatriation scheme for free passage, including wife and children, to Australia, on furnishing proofs of residence in Australia before war and, if application made within six months, discharge, desire you nominate responsible officer, your Government to determine eligibility of applicants. The application should be supported by following proofs: Statutory declaration by applicant, date, period residence in Australia and birth certificate or declaration by reliable person. Officer appointed by your Government may receive applications but hold till receipt of copy of Act, regulations and full instructions, now despatched."

The Minister observes that it is understood that the Government of Australia will reimburse the Department of Soldiers' Civil Re-Establishment for any expenses incurred in connection with the working out of the scheme outlined for the repatriation of Australian ex-members of the Canadian Forces.

The Minister, therefore, recommends that the Department of Soldiers' Civil Re-Establishment be authorized to act in behalf of the Government of Australia in arranging for the repatriation of such Australian ex-members of the forces, including their wives and children, as may be eligible under the Australian repatriation scheme for free transportation to Australia.

The Minister further recommends that, in order to facilitate the working out of the Australian repatriation scheme and in pursuance of the authority granted under Chapter 1, Section 25, Revised Statutes of Canada, the undermentioned officers of the Department of Soldiers' Civil Re-Establishment be authorized to receive evidence under oath from such Australian ex-members of the Canadian Forces as may apply for the benefits of the said Australian repatriation scheme, viz.:—

C. G. Arthur, Ottawa, Ont.
W. C. N. Marriott, Ottawa, Ont.
F. A. Ladd, Halifax, N.S.
W. R. Caldwell, Fredericton, N.B.

*Re-enacted by Order in Council, P.C. 2324, dated November 21, 1919, passed under authority of Soldiers' Civil Re-establishment Act, 1919.

John F. Buckley, Montreal, P.Q.
W. H. Smith, Kingston, Ont.
G. F. Morrison, Toronto, Ont.
Geo. E. Black, Guelph, Ont.
G. H. Boyd, Winnipeg, Man.
F. M. Riches, Regina, Sask.
Chas. H. Taylor, Calgary, Alta.
Geo. H. Deane, Vancouver, B.C.
G. H. Radford, Dawson City, Yukon.

The Committee concur in the above recommendations and submit the same for approval.

(Sgd.) RODOLPHE BOUDREAU,
Clerk of the Privy Council.

APPENDIX XV.

Regulations regarding War Service Gratuity due to ex-members of the Forces on the strength of the Department of Soldiers' Civil Re-Establishment for treatment.

P.C. 2119.

AT THE GOVERNMENT HOUSE AT OTTAWA,

MONDAY, the 1st day of December, 1919.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

Whereas under the provisions of Order in Council P.C. 3165, as amended by Order in Council P.C. 285, dated 5th February, 1919, and P.C. 1382, dated 9th July, 1919, it is provided that war service gratuity shall be payable upon the retirement or discharge from the naval or land forces of Canada, or upon appointment on the establishment of or engagement in the reconstituted permanent force or upon completion of demobilization;

And whereas by Order in Council P.C. 3165, dated 21st December, 1918, it is specifically provided, in paragraphs 9 and 11, as follows:—

"9. If any officer, warrant officer or man brought forward for retirement or discharge is entitled, pursuant to the recommendation of a medical board or a medical officer to receive pay and allowances (other than pension) from the Department of Soldiers' Civil Re-Establishment, he and his dependents shall not be paid the gratuity until he has submitted to such treatment as the Department of Soldiers' Civil Re-Establishment directs and has ceased to receive full pay and allowances from such department. The gratuity, when no longer payable as above, shall be paid in alternate monthly instalments of 31 and 30 days' pay and allowances."

"11. If any officer, warrant officer or man, before he and his dependents have received any part or the whole of the gratuity herein provided for, is reported as being entitled to or in receipt of full pay and allowances from the Department of Soldiers' Civil Re-Establishment, the gratuity or the part thereof which, at the time, remains unpaid, shall not be paid, but the officer, warrant officer or man and his dependents, upon his subsequently ceasing to be entitled to or to receive such pay and allowances, shall, if then otherwise eligible to receive the gratuity, be entitled to receive the same or the part thereof which remains unpaid in alternate monthly instalments of 31 and 30 days' pay and allowances."

And whereas by Order in Council P.C. 3165, dated 21st December, 1918, it is specifically provided in paragraph 12 as follows:—

"12. (*a*) If any officer, warrant officer or man dies before he and his dependents have received any part or the whole of the gratuity herein provided for and if there survive him dependents who would have been entitled under paragraph 3 above, to a portion of the gratuity equal to separation allowance,

or who would have been so entitled had the officer, warrant officer or man been in receipt of ordinary Canadian Expeditionary Force rates of pay and allowances immediately before his retirement or discharge, the portion of the gratuity unpaid at the time of his death shall be payable to such dependents.

(*b*) Except as provided in Clause (*a*) above, if any officer, warrant officer or man dies before he has received any part or the whole of the gratuity herein provided for, the portion of the gratuity unpaid at the time of his death shall not become payable."

And whereas by P.C. 1382, dated 9th July, 1919, it is provided that the following clause be added to P.C. 3165, of the 21st December, 1918:—

"When any officer, warrant officer or man, who has been since the 21st February, 1918, or may hereafter be retired or discharged from the Department of Militia and Defence or the Department of the Naval Service and on the recommendation of a board of medical officers passed direct to the Department of Soldiers' Civil Re-Establishment for further treatment for a disability incurred on or aggravated by active service, has been or is in pursuance of such recommendation placed on the strength of the Department of Soldiers' Civil Re-Establishment for such further treatment, the time during which such officer, warrant officer or man has remained or may remain on the strength of the Department of Soldiers' Civil Re-Establishment shall be added to his service with the naval or land forces of Canada and any war service gratuity to which he or his dependents may at the conclusion of such treatment, be entitled, shall be computed upon the length of service in accordance with the schedule attached hereto plus the period during which such officer, warrant officer or man is undergoing such treatment and is in receipt of pay and allowances from the Department of Soldiers' Civil Re-Establishment, any provisions in Clauses 1 to 16 hereof to the contrary notwithstanding."

And whereas by Order in Council P.C. 2007, dated 26th September, 1919, demobilization of the Canadian Expeditionary Force for the purpose of war service gratuity has been declared to be completed on the 1st day of October, 1919, and it is directed that no service performed after that date shall be taken into consideration for the purposes of the gratuity.

And whereas there now are in hospitals operated or controlled by the Department of Soldiers' Civil Re-Establishment certain patients who have, under the provisions above quoted, not received any portion of their War Service Gratuity, or who have not received the whole of their War Service Gratuity.

And whereas in the interests of discipline in the institutions in which these men are receiving treatment and in the interests of the men themselves it is most undesirable that, unless the circumstances are most exceptional, War Service Gratuity should be paid during the period of treatment, as provided by P.C. 2007, of the 26th September, 1919.

And whereas the Department of Militia and Defence is desirous of completing the payment of War Service Gratuity at as early a date as possible.

Now therefore His Excellency the Governor General in Council, on the recommendation of the Minister of Soldiers' Civil Re-Establishment, with the concurrence of the Minister of Militia and Defence, is pleased to order and it is hereby ordered:—

1. That paragraphs 9 and 11 of the Order in Council P.C. 3165, of the 21st December, 1918, be continued in full force and effect subject to the provisions of Clause "5" hereof.

2. That the provisions of Order in Council, P.C. 1382, dated 9th July, 1919, shall be subject to the provisions of Order in Council P.C. 2007, dated 26th September, 1919,

and that, in consequence, no period of treatment with the Department of Soldiers' Civil Re-Establishment beyond the 1st day of October, 1919, shall be reckoned towards the length of service with the Naval or Land Forces of Canada.

3. That, notwithstanding paragraph 14 of P.C. 3165 of 21st December, 1918, the Department of Militia and Defence shall pay over and transfer to the Department of Soldiers' Civil Re-Establishment, in a lump sum, all amounts of War Service Gratuity which may now or may hereafter be due to any man on the strength of the Department of Soldiers' Civil Re-Establishment for further treatment, and the Department of Soldiers' Civil Re-Establishment shall place such moneys to the credit of the men to whom they will be payable on the completion of treatment, on the books of the Department, and shall credit the patient with 5 per cent interest upon the unpaid balance which will become due to him on the completion of treatment; interest to be computed every three months,—at the end of March, June, September and December.

4. That notwithstanding paragraph 12 of P.C. 3165, of the 21st December, 1918, in the event of any officer, warrant officer or man on the strength of the Department for treatment, dying before he has been paid any portion or the whole of his War Service Gratuity, the amount unpaid be credited to his estate.

5. That notwithstanding paragraphs 9 and 11 of P.C. 3165, of the 21st December, 1918, the Department of Soldiers' Civil Re-Establishment is authorized, if it is found,—

(*a*) That the family or those dependent upon the patient, on the strength of the Department for treatment, is urgently in need of funds, owing to extraordinary circumstances, or,

(*b*) That the patient himself is urgently in need of funds, owing to extraordinary circumstances, on the case being submitted in detail to the Department, supported by such sworn statements or affidavits as the Department may require, stating why a portion or the whole of the War Service Gratuity should be paid, and for what purpose the money is to be used, to pay a portion or the whole of such War Service Gratuity to or on behalf of the said patient, subject to the proviso that all applications for the payment of the whole or any part of the War Service Gratuity, while a man is still on the strength of the Department for treatment, with such evidence as may be necessary, shall be submitted to the Head Office of the Department at Ottawa, and passed upon by a committee to be appointed for that purpose by the Minister of Soldiers' Civil Re-Establishment and the Minister of Militia and Defence, and the award of such committee shall be final.

(6) That when a patient on the strength of the Department of Soldiers' Civil Re-Establishment has completed his treatment, the amount of the War Service Gratuity remaining in the hands of the Department shall be paid to him, with accrued interest, by the Department, in the same number of monthly payments as though it had been paid to him direct by the Department of Militia and Defence, subject to the provisions of Clause "5" hereof.

(7) That notwithstanding that the moneys are placed to the credit of the man, if so required by the Department of Militia and Defence, the Department of Soldiers' Civil Re-Establishment will recover from any credit balance of War Service Gratuity so far as possible any overpayment or debit balance of military pay and allowances.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

APPENDIX XVI.

Authority under which the Department of Soldiers' Civil Re-establishment may make special provision for care of functionally, neurologically and mentally sub-normal men.

P.C. 2328.

Certified Copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 21st November, 1919.

The Committee of the Privy Council have had before them a report, dated 18th November, 1919, from the Minister of Soldiers' Civil Re-Establishment, stating that under the chairmanship of the Honourable J. A. Calder, P.C., M.P., the Special Parliamentary Committee on Bill 10, an Act to amend the Department of Soldiers' Civil Re-Establishment Act, in its report to the House of Commons which was adopted by that House, stated that the following suggestion had been made to the Committee during the course of its hearings:—

> "Suggestion 5.—During the course of the investigation by your Committee into matters relating to re-establishment, it was repeatedly brought out that special provision should be made for those functionally, neurologically, and mentally sub-normal men who cannot be completely taken care of under existing regulations."

The Minister further states that, based on the foregoing, the following recommendation was made by the Committee:—

> "Recommendation.—Your Committee recognize that there is an urgent necessity for the establishing of a means to take care of these problem cases. In view of the highly technical and difficult nature of the question they recommend that the Department of Soldiers' Civil Re-Establishment should take immediate steps to institute a thorough inquiry to determine the need and to recommend the means of best dealing with this difficult problem.
>
> "They further recommend that in the interim, or until such time as proper provision is made for the care of such cases, the Department be authorized to expend the money necessary to make provision for these cases."

The Minister recommends that in pursuance of the foregoing recommendation the Department of Soldiers' Civil Re-Establishment be authorized to expend such moneys as, in the discretion of the Minister, may be deemed necessary to make provision for the cases referred to, pending the result of an investigation, in connection with which the Department is formulating plans with a view to the submission of definite proposals to Your Excellency in Council at a later date.

The Committee concur in the foregoing recommendation and submit the same for approval.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

APPENDIX XVII.

Authority under which the Department of Soldiers' Civil Re-establishment may issue loans for the purchase of tools and for training or education in certain specified cases.

P.C. 2329.

Certified Copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 21st November, 1919.

The Committee of the Privy Council have had before them a report, dated 18th November, 1919, from the Minister of Soldiers' Civil Re-Establishment, stating that under the Chairmanship of the Honourable J. A. Calder, P.C., M.P., the Special Parliamentary Committee on Bill 10, an Act to amend the Department of Soldiers' Civil Re-Establishment Act, in its report to the House of Commons, which was adopted by that House, made the following recommendations:—

"(*a*) That the Department of Soldiers' Civil Re-Establishment at its discretion be authorized to advance by way of loan to those disabled men who have been re-trained and who are in need of same, a sum not exceeding $500 for the purchase of tools and equipment necessary to establish them in their new occupation, such loans to be repayable within five years from date of issue without interest.

"(*b*) That the Department of Soldiers' Civil Re-Establishment at its discretion be authorized to advance by way of loan to those men who were disabled and who are in need of same, a sum not exceeding $500, to enable them to pursue any course of training or education that was substantially interrupted by war service, providing in all cases that the disability was of such a nature as to make such assistance necessary and provided further that such men are not entitled to or have not taken training under the Department of Soldiers' Civil Re-Establishment; all such loans to be repayable in five years without interest."

The Minister recommends that the Department of Soldiers' Civil Re-Establishment be authorized to carry out the foregoing recommendations, subject to the condition that those to whom loans are made under paragraph (*b*) as above shall not be eligible for vocational re-training subsequent to the granting of such loans.

The Committee concur in the foregoing recommendation and submit the same for approval.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

APPENDIX XVIII.

Authority under which the Department of Soldiers' Civil Re-establishment may issue pay and allowances to men who commence vocational training pending approval of courses.

P.C. 2327.

Certified copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 21st November, 1919.

The Committee of the Privy Council have had before them a report, dated 18th November, 1919, from the Minister of Soldiers' Civil Re-Establishment stating that under the Chairmanship of the Honourable J. A. Calder, P.C., M.P., the Special Parliamentary Committee on Bill 10, an Act to amend the Department of Soldiers' Civil Re-Establishment Act, in its report to the House of Commons which was adopted by that House, stated that the following suggestion had been made to the Committee during the course of its hearings:—

> "Suggestion (4).—That the delay in making a decision as to an applicant's eligibility for training be reduced and that a man be granted allowances between the time of application for a course and the date of approval of his course.

The Minister further states that based on the foregoing the following recommendation was made by the Committee:—

> "*Recommendation.*—It is recommended that the Vocational Branch should actively pursue the policy as laid down in the past and as at present followed in this respect, with a view to doing everything possible to eliminate all unnecessary delays commensurate with a careful and proper investigation as to the eligibility of the applicant for training and further, as a measure to ameliorate the financial difficulties of applicants caused by unavoidable delays in this respect, that if a man is taken on for training by the District Disabled Soldiers' Training Board and his application is afterwards rejected the Department shall provide pay and allowances over the period he has been in training, except in cases where wilful misrepresentation has been discovered."

The Minister recommends that the above recommendation be carried out with the addition of the words "in accordance with Order in Council P.C. 387, 1919," after the words "pay and allowances" in the recommendation. The recommendation of the Minister will, therefore, read as follows:—

> "It is recommended that the Vocational Branch should actively pursue the policy as laid down in the past and as at present followed in this respect, with a view to doing everything possible to eliminate all unnecessary delays commensurate with a careful and proper investigation as to the eligibility of the applicant for training, and further, as a measure to ameliorate the financial difficulties of applicants caused by unavoidable delays in this respect, that if a man is taken on for training by the District Disabled Soldiers' Training Board and his application is afterwards rejected, the Department should provide pay and allowances in accordance with Order in Council P.C. 387, 1919, over the period he has been in training, except in cases where wilful misrepresentation has been discovered."

The Committee concur in the foregoing recommendation and submit the same for approval.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

APPENDIX XIX.

Authority under which the Department of Soldiers' Civil Re-establishment may make free issues of clothing to men undergoing medical treatment for a long period.

P.C. 2325.

Certified copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 21st November, 1919.

The Committee of the Privy Council have had before them a report, dated 18th November, 1919, from the Minister of Soldiers' Civil Re-Establishment, stating that under the chairmanship of the Honourable J. A. Calder, the Special Parliamentary Committee on Bill 10, an Act to amend the Department of Soldiers' Civil Re-Establishment Act, in its report to the House of Commons, which was adopted by that House, stated that the following suggestion had been made to the committee during the course of its hearings:—

> "Suggestion (1)—That the existing practice of issuing clothing on a re-payment basis to ex-members of the forces undergoing medical treatment and vocational training under the department at a cost lower than the prevailing retail prices be amplified to provide the issue of clothing at public expense to those undergoing medical treatment for a long period.

The minister further states that, based on the foregoing, the following recommendation was made by the committee:—

> Recommendation,—That the department be authorized to make such issues of clothing free of charge to ex-members of the forces undergoing medical treatment as in its discretion are necessary in these cases."

The minister recommends that the Department of Soldiers' Civil Re-Establishment be authorized to carry out the above recommendation.

The committee submit the same for approval.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

APPENDIX XX.

Authority under which the Department of Soldiers' Civil Re-establishment may pay interest on credit balances of ex-members of the Forces undergoing treatment.

P.C. 2301

Certified copy of a Report of the Committee of the Privy Council, approved by His Excellency the Governor General on the 21st November, 1919.

The Committee of the Privy Council have had before them a report, dated 12th November, 1919, from the Minister of Soldiers' Civil Re-Establishment, stating that it was provided by Order in Council of the 16th December, 1915, that fifty per cent of the pay of the rank and file of the Canadian Expeditionary Force be withheld from those who had not made any assignment of pay, the amount so withheld to be paid to the men on the termination of their engagement; that by subsequent Order in Council of the 15th May, 1916, this arrangement was extended to cover warrant officers and non-commissioned officers as well, and that by Order in Council P.C. 924, of the 3rd April, 1917, the Department of Militia and Defence was given authority for the payment of interest on the amounts so withheld at a rate not exceeding five per cent per annum.

It is also provided by Order in Council P.C. 387, of the 24th February, 1919, clause 16, that:—

> "No former member of the forces who is undergoing in-patient treatment by the Department of Soldiers' Civil Re-Establishment and is entitled to the allowances payable under this clause, shall, unless specially authorized by the department, be paid, for his personal use, a larger sum than $10 per month out of such allowances and the balance of his allowances shall be retained by the department to his credit and paid to him on the conclusion of his treatment."

The minister observes that having been allowed interest on balances of deferred pay standing to their credit while still on the strength of the Canadian Expeditionary Force, ex-members of the forces who are carried on the strength of the Department of Soldiers' Civil Re-Establishment for treatment for lengthy periods consider that they also should be allowed interest on balances of deferred pay standing to their credit with the Department of Soldiers' Civil Re-Establishment.

The minister states that there are at present approximately 2,500 former members of the forces on the strength of the Department of Soldiers' Civil Re-Establishment who have been receiving treatment for a period of three months or over, of whom 1,269 are without dependents, and it is not expected that the number of long treatment cases will greatly increase. The annual estimated amount of interest is less than $10,000.

The minister, therefore, recommends that from the date hereof the Department of Soldiers' Civil Re-Establishment be authorized to pay interest on the amounts of pay and allowances withheld, under the provisions of Order in Council P.C. 387, of the 24th February, 1919, or other enabling authority, from ex-members of the forces who have been on the strength of the department for medical or surgical treatment for a period of three months or longer, at the rate of five per cent per annum, to be credited on all open accounts of such former members of the forces as at the 31st March, 30th June, 30th September, and 31st December in each year, or at the date of completion of treatment, the amount of such interest to be charged to Parliamentary Vote No. 338.

The committee concur in the foregoing recommendation and submit the same for approval.

(Sgd.) F. K. BENNETTS,
Assistant Clerk of the Privy Council.

REPORT

OF THE

MINISTER OF AGRICULTURE

FOR THE

DOMINION OF CANADA

FOR THE

YEAR ENDING MARCH 31, 1919

PRINTED BY ORDER OF PARLIAMENT

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1919

[No. 15—1920]—1

CONTENTS.

	PAGE
I. General Remarks	3
II. Arts and Agriculture	5
Dairy and Cold Storage Branch	5
Seed Commissioners Branch	9
Live Stock Branch	19
Cattle Division	21
Sheep and Goat Division	24
Poultry Division	26
Markets Division	30
Feed Division	32
Dominion Experimental Farms and Stations	33
Division of Chemistry	46
Division of Field Husbandry	48
Division of Animal Husbandry	49
Division of Horticulture	52
Cereal Division	54
Division of Botany	56
Division of Forage Plants	57
Bee Division	59
Poultry Division	60
Tobacco Division	61
Division of Illustration Stations	62
Division of Fibre Plants	64
Division of Extension and Publicity	65
Health of Animals Branch	65
Meat and Canned Foods Division	70
Fruit Branch	71
Entomological Branch	78
International Institute Branch	81
Publication Branch	88

APPENDICES.

MISCELLANEOUS.

Order of the Board of Agriculture and Fisheries re Importation of Dogs .. 92

REPORT

OF THE

MINISTER OF AGRICULTURE

1918-1919

To His Excellency the Duke of Devonshire, K.G., P.C., G.C.M.G., G.C.V.O., etc., etc., Governor General and Commander in Chief of the Dominion of Canada.

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit to Your Excellency a report of the Department of Agriculture for the fiscal year ended March 31, 1919.

I. GENERAL REMARKS.

The work of the department was carried out in a most efficient and satisfactory way and there will be found included herein a summary of the operations of the different branches of the department, all of which is laid before Your Excellency under their respective headings.

The legislation affecting the department during this period consisted of:—

Chapter 8, 8-9 George V, intituled "An Act to amend the Animal Contagious Diseases Act." (Assented to May 24, 1918.)

Chapter, 8-9 George V, intituled "An Act to amend the Inspection and Sale Act (Fruit, Fruit Marks and Potatoes)." (Assented to May 24, 1918.)

Chapter 31, 8-9 George V, intituled "An Act to amend the Meat and Canned Foods Act." (Assented to May 24, 1918.)

By an Order in Council approved under date the 5th day of April, 1918, regulations were established respecting the grading and marking of eggs, under subsection (*c*) of section 9 of "The Live Stock and Live Stock Products Act."

Vide Canada Gazette, vol. LI, p. 3670.

By an Order in Council approved under date the 3rd June, 1918, the administration of the Trade Mark and Design Act and the Timber Marking Act was transferred from the Department of Agriculture to the Department of Trade and Commerce, together with the officials solely engaged in the administration of the said Acts.

By an Order in Council approved under date the 3rd day of June, 1918, the management of Canada's participation in international expositions abroad, the administration of quarantine regulations and matters connected with public health, together with the officials solely concerned in the administration thereof, were transferred from the Department of Agriculture to the Department of Immigration and Colonization.

By Order in Council approved under date the 6th June, 1918, the general regulations under "The Destructive Insect and Pest Act," established under date July 17, 1917, and amendments thereto, were further amended.

Vide Canada Gazette, vol. LI, p. 4385.

By an Order in Council approved under date the 15th day of June, 1918, the regulations governing the Inspection of Preserved Fruits, Vegetables and Milk, approved under date the 6th July, 1910, were repealed and new regulations substituted in lieu thereof.

Supplement to *Canada Gazette* of date June 29, 1918.

By Order in Council approved under date June 17, 1918, the administration of the law in regard to patents and copyright was transferred from the Department of Agriculture to the Department of Trade and Commerce, together with all officials solely engaged in the administration thereof.

By Order in Council approved under date the 17th day of June, 1918, Mr. Jos. H. Grisdale, B. Agr., the Director of Experimental Farms, was appointed Acting Deputy Minister of the Department of Agriculture.

By Order in Council approved under date the 18th July, 1918, regulations were established providing for the importation into Canada and the permitting of the manufacture, sale, and possession within Canada, of oleomargarine and establishing the conditions of such importation, manufacture, sale and possession, etc. These regulations were made in virtue of the provisions of the War Measures Act.

Vide Canada Gazette, vol. LII, p. 351.

By Order in Council approved under date the 5th August, 1918, the regulations established under "The Destructive Insect and Pest Act," approved under date July 17, 1917, and amendments thereto, were further amended.

Vide Canada Gazette, vol. LI, p. 1560.

By Order in Council approved under date August 10, 1918, regulations were made under the War Measures Act to prevent the burning of straw remaining from the crops of last year or the product of the crops of the present year, in the provinces of Manitoba, Saskatchewan or Alberta, without written authority from the Deputy Minister of Agriculture of the province in which such straw is situate. These regulations were made in order to conserve all possible feed for live stock owing to the critical crop situation in those provinces.

Vide Canada Gazette, vol. LII, p. 672.

By Order in Council approved under date 10th August, 1918, the regulations in force at that time under "The Dairy Industry Act," were rescinded and new regulations substituted in lieu thereof, which came into force on the 1st of September.

Vide Canada Gazette, vol. LII, p. 751.

By Order in Council approved under date the 30th day of September, 1918, regulations were established in regard to the sale of butter. These regulations were put into effect owing to an urgent request having been received from the British Ministry of Food for increased shipments of butter owing to the scarcity of butter or oleomargarine in Great Britain.

Vide Canada Gazette, vol. LII, p. 1280.

By Order in Council approved under date 23rd of October, 1918, all surplus fibre flax seed in Canada over and above such quantities as were needed to seed an area for each mill in 1919 equal to the area seed in 1918, was commandeered and placed under the control of the Dominion Government for the British Government.

Vide Canada Gazette, vol. LII, p. 1614.

By Order in Council approved under date the 26th October, 1918, regulations were established under "The Seed Control Act," respecting the importation of seeds into Canada.

Vide Canada Gazette, vol. LII, p. 1561.

By Order in Council approved under date the 26th October, 1918, the Order in Council of date the 7th of October, 1916, establishing special grades of grain, was amended by rescinding that portion thereof establishing the nomenclature of grades of grain for seed purposes and substituting certain definitions in lieu thereof.

Vide Canada Gazette, vol. LII, p. 1562.

By Order in Council approved under date the 21st December, 1918, the regulations under "The Animal Contagious Diseases Act," approved on the 30th November, 1909, and amendments thereof, were further amended.

Vide Canada Gazette, vol. LII, p. 2100.

By Order in Council approved under date the 3rd March, 1919, the regulations under "The Destructive Insect and Pest Act," approved under date 17th July, 1917, and amendments thereto, were further amended.

Vide Canada Gazette, vol. LII, p. 2772.

II. ARTS AND AGRICULTURE.

DAIRY AND COLD STORAGE.

New records were made for prices of dairy produce during the season of 1918. Under the stimulus of these high prices production was well maintained, notwithstanding the severe shortage of labour in many districts. There was some decrease in the production of cheese, but this was more than offset by the increase in the production of butter and condensed milk. The total value of all dairy products exported during the calendar year 1918 amounted to $50,558,005.

DAIRY PRODUCE COMMISSION.

The Dairy Produce Commission of 1918, representing the British Ministry of Food, succeeded the Cheese Commission of 1917, and handled the exportable surplus of cheese, butter, condensed milk and eggs. The members of the Commission were:—

James Alexander, Montreal.

J. A. Ruddick, Dairy and Cold Storage Commissioner, representing the Department of Agriculture;

Dr. Jas. W. Robertson, representing the Canada Food Board;

A. J. Mills, Liverpool, representing the British Ministry of Food;

Jas. Donaldson, Atwood, Ont., and A. Gerin, Coaticooke, Que., representing the Canadian producers.

The following table shows the total quantities and values of the different products handled by the Cheese Commission of 1917 and by the Dairy Produce Commission of 1918:—

	1917-18.		1918-19.	
	Quantities.	Values.	Quantities.	Values.
		$		
Cheese ..... lbs.	157,603,281	34,275,497	148,795,362	34,756,950
Butter ..... "	.....	.....	9,780,252	4,586,194
*Cond. Milk ..... cases.	.....	.....	582,116	3,810,711
†Eggs ..... "	.....	.....	17,621	268,134
	.....	34,275,497	.....	43,421,989

Values for 1917–18	$34,275,497
Values for 1918–19	43,421,989
	$77,697,486

*48 tins of 14 ounces. †30 dozen.

The price which the commission was authorized to pay for cheese during the first part of the season of 1918 was 23 cents. Authority was issued later to pay 25 cents for all cheese offered to the commission after September 30. The average works out at 23·35 cents per pound for the season.

THE SCARCITY OF RENNET.

The supply of rennet to be used as a coagulant in the manufacture of cheese was much larger in 1918 than during the two previous seasons, and the indications are that the danger of an actual shortage of coagulants which threatened the cheese industry for some time after the outbreak of the war is now a thing of the past, although the prices are still abnormally high.

FINCH DAIRY STATION.

The Finch dairy station operated as a model cheese factory and creamery and milk and cream shipping station. The quantity of milk received during 1918 shows a large increase over any previous year, the total quantity being 3,859,217 pounds. The total quantity received in 1914 was 2,356,202 pounds. The net value of the milk to the patrons in 1918 was $2.14½ per 100 pounds, delivered at the factory, plus the value of skim-milk and whey returned to them. The revenue on manufacturing account at the Finch dairy station in 1918 exceeded the total expenditure, including $701.25 on capital account, by $429.50, thus enabling the department to conduct a useful demonstration in the proper methods of operating cheese factories and creameries, and affording at the same time the facilities for experimental work not only without cost but with an actual profit.

MADAWASKA CREAMERY.

The Madawaska creamery at St. Hilaire, N.B., was again operated as a demonstration station. The number of patrons and the output both increased during the year. This establishment will be on a self-sustaining basis in 1919 and will be turned over to the local company.

COW TESTING.

The cow testing has made good progress under the new plan inaugurated in May, 1918. The services of 35 dairy recorders were dispensed with, and provincial supervisors appointed in New Brunswick, Nova Scotia, Prince Edward Island, Manitoba, Saskatchewan and Alberta, in addition to those already employed in Ontario and Quebec. Arrangements were made to have the samples tested at cheese factories, creameries and other places.

Under this plan the work covers the whole country instead of being confined to localities, and the cost of carrying it on has been very materially reduced. As was to be expected under the change of system, there was a temporary decrease in the number of cows under test in 1918 (22,412 as compared with 27,280 in 1917), but the foundation was laid for a much greater extension of the work than was possible under the former plan of operation.

Statistics show that there has been a very large increase in the average production of milk per cow since the keeping of records was first advocated and established by the Dairy Branch.

INSPECTION OF DAIRY PRODUCTS.

The suspension by Order in Council of December 5, 1917, of subsection (a) of the Dairy Industry Act, thus permitting, temporarily, the importation, manufacture and sale of oleomargarine in Canada has added to the importance of the dairy laws and regulations thereunder, and at the same time has increased the work of administration.

There were twenty-nine convictions for violation of the Dairy Industry Act during the year.

GRIMSBY PRECOOLING AND EXPERIMENTAL FRUIT STORAGE WAREHOUSE.

This establishment is still being operated on commercial lines, to demonstrate the value of the precooling of fruit for long distance shipments, and also the importance of having refrigerated space available for short time storage of tender fruits. A considerable quantity of berries were stored for periods varying from one to seven days, until such time as the canning factories could handle them. Several thousand dollars worth of strawberries and raspberries were saved from being a total loss in this way. The growers also use the warehouse for storage purposes while accumulating carload shipments, or Saturday pickings which are held over until Monday.

The capacity of the Grimsby plant is now taxed to its utmost, and a great deal more fruit would be offered if storage space were available. It is proposed, therefore, to instal mechanical refrigeration in place of the Gravity Brine system with which the warehouse is now equipped. In this way a large amount of space now used for the storage of ice will be available for fruit storage, and with mechanical refrigeration the capacity of the precooling rooms will be increased by using lower temperatures, and by having a greater reserve of refrigeration.

CREAMERY COLD STORAGE BONUSES.

Twenty-seven applications were received during the year for the bonus of $100 paid to creameries to assist in the erection of suitable refrigerators for the storage of butter awaiting shipment. There were nineteen applications approved and paid in full, four were held for further consideration, and four were refused for various reasons.

REFRIGERATOR CAR SERVICES FOR BUTTER AND CHEESE.

The usual special refrigerator car service for the carriage of butter in less than carload lots was in operation, by arrangement with the railway companies, from May to October. The iced-cheese car service, by which shippers are enabled to secure iced cars for the shipment of cheese in car lots, was also in operation during the hot weather.

SMALL COLD STORAGES.

The Dairy Branch continues to receive many inquiries for plans and specifications for small refrigerators, suitable for the use of farmers, country stores, summer homes, and other places where ice is stored for domestic purposes.

COLD STORAGE ACT.

There were no contracts entered into during the year for the payment of subsidies under the Cold Storage Act.

NEW PUBLIC COLD STORAGE WAREHOUSE AT MONTREAL.

The Harbour Commissioners of Montreal have been authorized to erect a large modern cold storage warehouse on the harbour front at Montreal, to be designed especially for the export trade. Building operations will be begun at an early date. This warehouse is to be of the very latest and most approved construction, and should be of great advantage to the export trade in perishable food products.

CARGO INSPECTION.

The disorganized state of shipping, due to the war, has interfered to some extent with the efficiency of the cargo inspection service. The irregularity of the service made it difficult to secure thermograph records, and the secrecy with which the sailing of steamers was surrounded often prevented proper inspection being made. It is hoped, with a return to more normal conditions in the shipping world, that it will be possible to bring cargo inspection work, both at Canadian and United Kingdom ports, back to normal efficiency during the season of 1919.

DOMINION EDUCATIONAL BUTTER SCORING CONTEST.

I have authorized the Dairy Commissioner to inaugurate a Dominion Educational Butter Scoring Contest, to be carried on throughout the season of 1919. Samples are to be sent once a month throughout the summer from creameries selected by the authorities in the different provinces to a central grading room at Montreal. After careful scoring a report will be sent to all the creameries participating, and to others who are interested in such matters. The samples will be paid for by the department, and retained for the purpose of re-scoring every month. A full record of the churning of each sample will be furnished with the report of the scoring.

The object of this undertaking is to promote uniformity in the character and quality of Canadian butter, and to bring the methods which produce the best results to the notice of all concerned.

DAIRY PRODUCE MARKET REPORT.

A suggestion of the Dairy Commissioner to inaugurate a Dairy Produce Market Report also has my approval. The service will consist of a weekly letter issued every Monday and sent free to any person who applies for it. Telegraphic reports will be sent free on Mondays and Fridays to designated officials in different localities, and collect telegrams will be sent to any person on request.

GENERAL NOTES.

The services of Mr. Joseph Burgess were loaned to the Dairy Produce Commission of 1918, for whom he acted as chief grader of butter and cheese. Mr. Burgess also filled a similar position with the Cheese Commission in 1917.

The Canada Food Board requisitioned Mr. J. F. Singleton, chief inspector of dairy products, for part of the year. Mr. Singleton was given an important position in the produce section.

PUBLICATIONS.

The following publications in the Dairy and Cold Storage Series have been issued during the year:—

Bulletin No. 54, "List of Cheese Factories, Creameries and Skimming Stations."

Circular No. 25, "Keeping Dairy Herd Records."

Circular No. 26, "The Care of Cream for Buttermaking."

A Report of the Proceedings of a Dominion Dairy Conference held at Ottawa, November 25-28, 1918.

THE SEED COMMISSIONER'S BRANCH.

The work of the Seed Branch has been continued under the divisions of Seed Production, Markets Intelligence, Seed Testing, Seed Inspection and Seed Purchasing Commission.

Seed production in Canada has been modified by war conditions. Formerly many kinds of seeds needed for planting in Canada were imported from other countries. Because of war-time difficulties in securing supplies, pronounced efforts were made to stimulate home production, and with a fair measure of success.

Information regarding seed markets for the producers and sources of supply for buyers of seeds has been much in demand for several years. It was thought advisable to organize this service under an experienced officer, so that the service may be extended and made of the greatest possible assistance to seed growers in Canada.

The work of seed testing has continued to increase each year about 10 per cent over that of the preceding year. It has been found expedient, during the past year, to establish an additional laboratory at Winnipeg, Man., for the service of north-western Ontario, Manitoba, and Saskatchewan.

Enlargement of the Seed Inspection Division has been made necessary because of the need for more effective control over the quality of grass, clover, and other seeds

imported for use in Canada. In other respects the seed inspection work has continued as in previous years, including the maintenance of a service at the Canadian Government interior terminal elevators.

The war-time work of the Seed Purchasing Commission, with a personnel of experienced Seed Branch officers, has been of much benefit in maintaining a high standard of crop production during the period of the war. During the past season this commission has purchased, assembled, cleaned and distributed seed grain to the value of more than six million dollars. It is not anticipated that the service of this commission may be needed following the conclusion of the war.

SEED PRODUCTION.

Field crop competitions, local seed fairs, and provincial seed exhibitions are encouraged by subventions to the provincial Departments of Agriculture amounting to approximately one-half of the total cost of conducting these services. They continue to prove a very important means toward the production of superior seed crops, and are being extended in some of the provinces.

FIELD CROP COMPETITIONS.

During the summer of 1918 field crop competitions were held in the various provinces and subventions claimed as follows:—

	Number.	Subvention Paid.
Prince Edward Island	9	$ 710 23
Nova Scotia	11	1,024 33
New Brunswick	12	570 00
Quebec	96	4,280 00
Ontario	198	13,948 67
Manitoba	27	1,791 25
Saskatchewan	15	1,568 04
British Columbia	32	1,040 00
	400	$23,932 52

The total subvention paid for field crop competitions was about $2,300 less than in the previous year, which is due to no claims having been received from Alberta. In the rest of Canada the number of competitions was increased by twenty-four, principally in Quebec and Manitoba.

LOCAL SEED FAIRS.

Local seed fairs were held during the calendar year 1918 and subventions paid as follows:—

	Number.	Subvention Paid.
Prince Edward Island	3	$ 135 43
Nova Scotia	5	293 34
New Brunswick	7	345 33
Quebec	61	2,889 50
Manitoba	18	582 31
Saskatchewan	27	1,143 41
Alberta	32	1,559 00
	153	$6,948 32

The number of seed fairs was increased in Quebec by ten, but the total amount of subvention remained practically the same as the previous year.

PROVINCIAL SEED EXHIBITIONS.

Following are the provincial seed exhibitions and subventions paid thereon:—

Prince Edward Island	$ 403 49
Nova Scotia	232 33
New Brunswick	385 84
Quebec	462 66
Ontario, Guelph	600 00
" Kemptville	236 00
Manitoba	500 00
Alberta	400 00
	$3,320 32

The amount of these subventions is about $300 less than the previous year, which was approximately the sum paid to Saskatchewan toward her 1917 exhibition prizes.

ASSISTANCE TO C.S.G.A.

Financial support to the work of the Canadian Seed Growers' Association was continued during the fiscal year 1918-19 to the extent of $7,500 from the Seed Branch appropriation. The last annual report of the association shows 393 members and 1,411 other growers engaged in the production of registered and improved seeds.

FIELD-ROOT AND VEGETABLE SEEDS.

The situation in Europe had become very serious during the winter of 1917-18 and exports of field-root and vegetable seeds, already very restricted by embargoes in the interest of food production, were practically cut off altogether. Supplies in Canada, while sufficient for the 1918 crop, were falling to the danger limit. Under the circumstances unusual efforts were made to stimulate the home production of these essential seeds.

Field officer, Mr. A. McMeans, visited the more important seed-growing farms in the United States and gained valuable information for the use of Canadian growers. Further co-operation in production was sought and obtained from Dominion and provincial experimental farms and stations and minimum prices calculated to cover the war-time cost of production were guaranteed to growers in British Columbia, which had proven to be exceedingly well adapted to the production of these seeds.

Seed stocks for growers were supplied or approved by the Experimental Farms Branch, which in 1917 had undertaken field-root seed production in quantity for commerce. The Agricultural Department of the University of British Columbia supervised provincial efforts and took over the inspection of both their growing seed crops and recleaned seed. Valuable seed stocks were obtained from the Field Husbandry and Horticulture Departments of the Ontario Agricultural College, and the corresponding departments of Macdonald College gave support in Quebec. Growers were offered seed stocks and growing contracts by the trade. The results of united efforts in the production of these biennial seed crops will be more apparent in 1919.

But the total quantity of home-grown seeds produced in 1918 is about 100 tons, being over three times that of 1917. The Experimental Farms Branch harvested nearly 80,000 pounds. At writing, returns from British Columbia are incomplete but the estimated production is 40,000 pounds. Over 96,000 pounds

passed our inspection in Eastern Canada, and subventions were paid thereon to private growers amounting to $6,877.98. The kinds and amounts produced under Seed Branch supervision in Eastern Canada were: sugar beet, 61,780 pounds; swede turnip, 26,668; mangel, 1,841; carrot, 312; onion, 2,742; radish, 1,518; parsnip, 835; garden beet, 267; and smaller quantities of tomato, celery and cabbage. The principal kinds produced in British Columbia are sugar beet, mangel, onion and radish.

WESTERN CANADA TIMOTHY SEED.

The Alberta timothy seed crops of 1916 and 1917, amounting to approximately one million pounds for each season, were assembled at the Canadian Government terminal elevator at Calgary, where they were handled on the same general basis as flaxseed and the cereal grains. Each grower's product was received separately and, on being cleaned to the grades defined under the Seed Control Act standards, was binned accordingly and a warehouse receipt issued. Elevator charges were made very moderate by the Board of Grain Commissioners with a view to the encouragement of the industry, and the service proved very valuable by enabling the growers to put their seed on the market in a finished condition. The South Alberta Hay growers were the heaviest producers and sold their entire 1917 crop of cleaned seed at favourable prices for each grade.

The drought of 1918 wrought havoc on the timothy seed crop as on cereal grains generally in southern Alberta. Practically no timothy seed came forward to the elevator, but this service with that of our seed analysis, grading and inspection staff at Calgary are again available for the 1919 seed crop.

Efforts are being made to promote the growing of timothy seed in the more northern districts of the three prairie provinces, especially in localities where cereal grains do not mature successfully in the average year. The timothy seed crop is considered a by-product of ranching or mixed farming, and is quite remunerative in favourable seasons.

MARKETS INTELLIGENCE.

The Markets Intelligence Division of this branch has been instituted with a view to extend more efficient service to seed producers, and also to merchants and co-operative organizations of farmers who are in need of seed supplies. Northern-grown seed supplies when of superior quality have come to be quite popular and are much in demand, both for domestic trade and for export. A great deal of useful work has been undertaken and good results obtained from the encouragement extended to seed growers to increase supplies and improve the quality of the seeds grown by them. The increased help that may now be extended to them in the marketing of their seed will doubtless prove to be of decided advantage.

SEED TESTING.

The object of seed testing is to determine as accurately as possible before seed is sown the nature and vigour of the crop that will result from its use.

Farmers send samples to the seed laboratory to determine their suitability to be used on their farms or to be sold to their neighbours. Merchants use the laboratory to

learn how their seeds should be graded or labelled to comply with the requirements of the Seed Control Act. Samples are also tested for various organizations whose object is the improvement of Canadian agriculture. The Canadian Seed Growers' Association, the Seed Purchasing Commission, various seed fairs and institutions have had free seed tests made during the past year. The number of samples received from merchants, farmers and institutions at the Ottawa and Calgary seed laboratories during each of the past few years, was as follows:—

	1917-18.	1916-17.	1915-16.	1914-15.
Ottawa	13,084	12,431	13,248	11,517
Calgary	11,892	13,547	8,215	8,412

From July 1, 1918, when the present laboratory year commenced, to March 31, 1919, 27,239 samples were received in the three laboratories, as follows:—

Ottawa	10,425
Winnipeg	8,073
Calgary	8,741

The Winnipeg laboratory was opened in October, 1918. That there was need for a seed control station at this point is shown by the fact that such a large number of samples was received within the first few months the laboratory was in operation.

Testing for Farmers.

Seed testing is especially important to the Western grain grower because the vitality of his grain is more often impaired by frost than is that in other parts of Canada. About 85 per cent of the samples received at Calgary and Winnipeg are sent by farmers or agricultural organizations, and consist chiefly of grain to be tested to determine its vitality. A considerable proportion of the samples are tested for purity as well as vitality, and the sender is advised as to the kinds and numbers of weed seeds which his grain contains.

Of the samples of western oats examined last season nearly 90 per cent contained noxious weed seeds of one or more kinds. About 80 per cent contained wild oats at the average rate of 65 per pound of grain. A very low percentage of the samples of oats received during the average season will make first class seed. The proportion is higher in the case of barley and wheat especially the latter.

In Eastern Canada the vitality of the grain produced is usually satisfactory, although it is always advisable for farmers to have every lot of seed tested for purity and vitality before it is sown. Most of the testing required of the Ottawa laboratory is in connection with the grading of timothy, red clover, alsike and alfalfa. During the seed testing season of 1917-18 2,712 samples of timothy, 2,199 red clover and 1,730 alsike were tested at Ottawa. A large proportion of the samples are sent by dealers, but an increasing number of farmers are having their clover and grass seeds tested before using or selling them.

Tests of Imported Seed.

The testing of samples of seeds required in the enforcement of the Order in Council regulating importation, has added very materially to the work of the seed laboratory during the past season. At Ottawa, for instance, 2,143 samples were received from the Customs Department up to March 31, 1919.

Official and Investigation Tests.

During the last seed testing season 563 official samples taken by seed inspectors in connection with the enforcement of the Seed Control Act, and 1,199 samples of vegetable seeds in paper packets, were tested. Several thousand other tests were made in connection with investigations into the quality of seed being used by farmers, methods of sampling bulk lots of seed to secure representative samples, and other lines of research.

The three laboratories are co-operating with the Association of Official Seed Analysts of North America in the study of improved methods of seed testing. Mr. H. B. Sifton, M.A., of the Ottawa laboratory, attended the annual meeting of the association in Baltimore in December, 1918.

Frozen Oat Investigation.

Last summer Mr. J. R. Fryer, M.A., of the Calgary laboratory, commenced a study of the effect of frost on the vitality of oats. The aim of this work is to determine the injury to the vitality of oats at different stages of maturity caused by frosts of different degrees, and to learn the precise physical effects of such frosts, so that, if possible, frost injury may be recognized and its extent approximately determined by inspection. The work done last season was preliminary and it is unsafe to draw any conclusions from the work of one year, but in general it may be said that there are strong reasons for suspecting that some very prevalent ideas in regard to the effect of frost on oats are erroneous. The investigation is being continued and enlarged.

Educational Work.

The laboratories are continuing the work of supplying material and other assistance to schools where seed studies are taken up. By this means, and through the agency of official publications and the farm press, it is aimed gradually to improve the knowledge possessed by our farmers in regard to qualities of good seed and the importance of using only the best.

FEED ANALYSIS.

Research in Microscopic Analysis.

This is an outgrowth of the work of examining ground feeding stuffs for whole-weed seeds, there having been reason to believe that weeds were being spread through the medium of such feeds. As a result of these analyses and of investigations into the feeding value of elevator screenings, the custom was established of forwarding to the Seed Branch samples of feeds reported to be unpalatable or to have caused injury or death to the animals fed.

It is known that many of our common weed seeds are very unpalatable, and that others are poisonous. In order effectively to analyze feeds from this standpoint it was necessary to find means of identifying such seeds when ground. Investigation has been undertaken with this end in view, and it is now possible, by means of the microscope, to analyze ground feeds and report their constituents, harmful or otherwise.

Investigation of Canadian Feeding Stuffs.

In co-operation with the Experimental Farms Branch, an investigation of the composition of the concentrated feeds on sale in Canada has been undertaken. Some four hundred samples of various feeds have been collected to date. Of those so far examined 36 per cent contain seeds of the mustard family, and these are the seeds which give most trouble to stockmen. In a few feeds other harmful seeds, such as purple cockle and cow cockle, were found. Their occurrence is rare, however, when compared with that of the mustards.

Analysis for Farmers.

The service of the microscopic laboratory has not been announced, but notwithstanding this, a considerable number of farmers' samples are received for analysis. Many of them are forwarded by various institutions who have received them and are not in a position to make the analyses. Practically all are from feeds alleged to have been found harmful and unpalatable, and the majority contain seeds known to be poisonous. In some cases the seeds are finely ground so that they cannot be detected and identified without the use of the microscope. Other feeds contain them in a coarsely ground or unground condition, and are thus dangerous from the standpoint of spreading weeds.

Study of Animal Food Laws.

This state of affairs, aggravated by the present high cost of feeding stuffs, has suggested the need of an addition to our present legislation with respect to the sale of animal foods. With this in view a comprehensive study has been made of the laws of various countries and states, the object being to ascertain what portions of these laws would be suitable for Canadian conditions, and what modifications and additions would be advisable.

Educational Work.

In this field a small beginning has been made. A description of our common poison weed seeds and their effects has been published, and distributed among the members of the veterinary profession in Canada. The subject has also been taken up with the Ontario Veterinary College in Toronto, and we have the assurance that special studies along these lines are to be added to their curriculum.

SEED INSPECTION.

The regular activities of the Seed Inspection Division have been conducted along much the same lines as in previous seasons, with the introduction of some new work which was rendered necessary for the protection of Canadian agriculture, largely on account of the ordinary sources of seed supply being greatly interfered with in respect to both quality and quantity because of war conditions.

Import Regulations.

It was found that considerable quantities of seed low in germination or containing large quantities of noxious weed seeds were being imported into Canada. Some lots

of red clover seed which were very low in vitality and had been refused admittance into the United States on this account were imported by Canadian dealers. To protect Canadian agriculture against low quality seed, an Order in Council was recommended and passed prohibiting the importation into Canada of any seed which was not fit for seeding purposes within the terms of the Seed Control Act. Samples of all lots of seed entered for consumption in Canada are now taken by Customs officials and forwarded to the Seed Laboratories for test. Where satisfactory evidence is furnished that the seed has been tested and is suitable for seeding in Canada the shipments are immediately released, but where evidence of this sort is not furnished release is not given until reports are received from the seed laboratory. Previous to the passing of this Order in Council there were no restrictions on the quality of seed which might be imported into Canada. The present regulations have been applied with very little delay in delivery of shipments and have afforded means of preventing the importation and distribution of considerable seed which would be useless or dangerous for use on Canadian farms. The Order also provides means for securing statistics which previously were not available on the imports of the most important kinds of seeds.

Seed Surveys.

Seed surveys have been conducted concurrently with those made by the Bureau of Markets of the United States Department of Agriculture. Schedules are sent to seed merchants for July 1 and January 1 to secure information respecting stocks on hand, purchasing, requirements, etc,. of various kinds of seed. By this means valuable information was secured respecting general conditions of the seed trade in Canada and the United States which was of great benefit to the department for its own use and in connection with recommendations to the Canada Food Board on applications for import and export licenses for seed shipments.

Grading for Trade and Farmers.

The regular work of the Seed Inspection Division during the past year has included the grading of seed samples, after the purity tests had been made, and reporting to the seed merchants or farmers who submitted the samples for test. The policy in respect to grading timothy and clover seeds has been to place less emphasis on appearance and to grade largely on weed-seed content, so long as the seed is reasonably good in respect to general quality, including colour, plumpness, etc. The object has been to prevent discrimination against Canadian grown seed which may not appear quite so attractive on account of the presence of some discoloured seeds as certain imported stock, but is probably more valuable for seeding purposes on account of being acclimatized

Advice on Seed Cleaning.

When sending reports to farmers information is given respecting the best means to use in fitting their seed for market. From the impurities in the samples submitted information can be given regarding the sieves with which fanning mills should be equipped to make the best and most economical separations.

General Inspection.

The general field inspection has been conducted along much the same lines as in previous years. The territory has been rather more thoroughly covered this season than was possible during the war. Each district officer is directly responsible for the inspection work in his territory. During the trade season temporary inspectors are employed to assist the district officers. Seed merchants and farmers who are selling seed are visited and samples of any lots suspected of being offered for sale in violation of the Seed Control Act are taken and forwarded to the seed laboratory for test. The inspection has shown that for the most part the Seed Control Act regulations are being well observed, particularly by the wholesale trade. Where violations have occurred they are principally in seed producing districts where the local dealers or farmers are not familiar with or have not strictly followed the requirements.

Paper Packet Inspection.

The inspection of seeds put up in paper packets has been made principally through securing representative packets of the different kinds and varieties of seeds put out by various seed merchants and testing them for germination. In this way a good general idea of the quality of the seed being distributed is obtained and if any particular kinds or varieties are found to be inferior further investigation is made. The quality of seed sold in paper packets during the past few seasons has been good, for the most part, considering the difficulties in securing stocks.

Inspection for Seed Purchasing Commission.

During the past season a large proportion of the seed inspection work has been in connection with the inspection of seed grain being purchased and distributed by the Seed Purchasing Commission. Seed inspectors were placed in each of the elevators where the commission was purchasing and cleaning seed grain. All cars coming into the elevators were inspected and if within the seed standards, certificates were issued and the grain separately binned. When seed grain was ordered from these elevators it was all subject to inspection during the process of cleaning, and ex-elevator certificates were issued when the seed was cleaned to the standards defined for the guidance of the inspectors. Inspection was also provided at shipping points for the oats purchased by the commission in Ontario for shipment to the Port Arthur elevator.

SEED PURCHASING COMMISSION.

The Canadian Government Seed Purchasing Commission was established in the autumn of 1916, practically as a division of the Seed Branch, to provide against seed shortages in districts where unfavourable climatic conditions had seriously injured the principal field crops. During the seed seasons 1916-17 and 1917-18, practically six million dollars worth of field seeds, including wheat, oats, barley, rye, peas, beans, and corn, were purchased, assembled, stored, cleaned, and distributed to farmers, farmers' organizations, municipal governing bodies, Provincial Governments, and seed dealers. Working capital was made available to the commission by Orders in Council, and the moneys received from sales of seed were returnd to the Government.

1918 Crop Conditions.

Summer and autumn surveys of crop conditions in respect to seed supply revealed grave conditions in the southern parts of Alberta, Saskatchewan, and south-western Manitoba, where dry weather had very seriously injured the cereal grain crops. Northern districts, too, had in certain cases, suffered from late summer and autumn frosts. In the eastern and northern parts of the province of Quebec grain crops were badly damaged by prolonged wet weather during harvest. Fortunately grain crops were excellent in Ontario, and the Maritime Provinces had an abundant supply of seed grain with a surplus for export from Prince Edward Island.

Emergency Requirements and Supplies.

Estimates of probable seed shortages in districts where grain crops had been virtually destroyed by drought or frost were obtained by provincial Departments of Agriculture, in part through their officers of municipalities, and made available to the commission. This data was carefully checked by agents of the commission who visited most of the areas in need of seed grain, as well as those districts from which a surplus of good seed might reasonably be expected.

Ultimately sufficient seed grain was obtained in central and northern Alberta to supply the demands on the commission from southern Alberta and the frost-injured districts. In northern Saskatchewan and Manitoba, however, the oats were so badly polluted with wild oats that only a very limited quantity would qualify as No. 1 seed. Sufficient No. 2 seed oats, which may contain up to ten wild oats per pound, were obtained to meet the requirements of these provinces, but practically a half million bushels of No. 1 seed oats had to be purchased in eastern Canada, including a limited quantity in Minnesota.

More than thirty thousand bushels of these oats were the Banner variety grown from registered seed in Prince Edward Island and Ontario, and obtained by request of Mr. W. M. Graham, Commissioner of the Department of Indian Affairs, Regina. They were to be seeded on the new and clean lands of the Indian reserves that were brought under cultivation in 1918, and it is the intention that the crop therefrom will be assembled, cleaned, and distributed for seed purposes for the 1920 crop in Alberta and Saskatchewan. The advantage of making provision for a probable supply of over 300,000 bushels of seed oats of the best known variety and free from wild oats will be obvious to all who understand the needs of the prairie provinces.

Co-operation of Government and Other Agencies.

Mention has already been made of provincial Departments of Agriculture estimates of seed requirements. The Saskatchewan Department of Agriculture placed orders and took direct charge of seed distribution to homesteaders in the unorganized municipalities of the province; and the Ontario Department of Agriculture, through its district representatives rendered most valuable assistance in assembling and inspecting seed oats for shipment. The work of the commission was facilitated by the regulations issued as Orders by the Board of Grain Supervisors, and the hearty co-operation of the Board of Grain Commissioners, Department of Trade and Commerce, who made available their system of interior terminal elevators at Calgary,

Moosejaw, Saskatoon, and Port Arthur for the assembling, storing and cleaning of seed grain. The Canadian Government elevators under the Harbour Commissioners at Quebec and Montreal were also made use of by the commission. Special freight rates on seed grain were given by the Canadian railways.

Procedure and Business.

The grain was cleaned to seed grade standards, defined by Order in Council, and inspected by Seed Branch officers, who issued ex-elevator seed certificates on each carlot shipped out on the order of the Seed Purchasing Commission. The prices asked by the commission were calculated to cover the average cost of the seed grain, including the premiums paid for the superior stocks which could be cleaned to the seed grades, also charges for storage, cleaning, shrinkage in cleaning, sacks and sacking where required. The services both of the permanent officers of the Seed Branch who formed the personnel of the commission and of the Seed Inspection staff were not charged against the cost of the seed grain.

The business of the past season represents a turnover of approximately six million dollars. The transactions of the commission for the year ending June 30, 1919, are not closed at writing, but it is known that every dollar authorized for seed purchases during the past three years will have been returned when the war-time duties of the commission are concluded, and in addition there will be a small balance to cover operating expenses and interest on capital while employed.

THE LIVE STOCK BRANCH.

HORSE DIVISION.

Federal Assistance to Horse Breeding.

Under this policy a number of breeders in any district may form a club for the purpose of hiring a stallion for the use of the members, and all complying with the regulations receive a certain percentage of the service fee from the Live Stock Branch.

This scheme was inaugurated in 1915, and in that year only nine clubs qualified for the Federal grant. Since that time it has steadily grown, particularly in the Western Provinces, where the scheme has appealed specially to the breeders.

By co-operation, communities have been able not only to obtain but retain the services of good stallions at a very reasonable service fee. Although this scheme has only been four years in operation, one or two districts have kept the same stallion for the whole period. Others have had the same horse for three years. Many who have had the same horse for the last two years have again secured his services for the present season. In this way community breeding has been established and the systematic adherence to one breed made possible.

Stallion owners whose horses are hired to clubs are assured of a guaranteed number of mares and prompt payment of the service fees at a specified time. The payment of one-third the service fee at the end of the service season should give the stallion owner sufficient ready cash to, generally speaking, pay for the season's expenses.

One advantage which has been clearly demonstrated is the fact that club stallions leave a high percentage of strong, healthy, vigorous colts. After four years it has been established that at least 80 per cent of the club horses have left over 50 per cent of their mares in foal. Some have left as high as 90 per cent, while the average has been around 65. This is undoubtedly due to the fact that club members, generally speaking, breed a better class of mares and take better care of them. The stallion owner through having a guaranteed number is able to so divide the season that he does not have to overbreed his horse on any one day or during any one week. Thus, the stallion is at all times strong and vigorous and capable of transmitting same to his progeny.

The putting of the horse breeding business on a financial basis is encouraging owners to buy better horses than heretofore. The inspection, which all stallions have to undergo, and the regulating as far as possible of the service fee, is also having a beneficial effect.

The experience gathered during the last four years is emphatically to the effect that clubs should organize early. In fact, organization should not be put off later than the middle of January and better if it is done before that date. Those that are in a position to hire early get the pick of the best horse. The experience of the Branch is that horses hired early invariably pass inspection and are with few exceptions up to the required standard.

In Scotland, where the Scottish premium system has made the Clyde horse what he is to-day, it is not an uncommon thing to find the best horses hired two and even three years in advance. In fact, some are to-day hired as far ahead as 1923.

Federal assistance to horse breeding was inaugurated for the purpose of stabilizing the business and of helping equally both the breeder and the stallion owner. That it has met with the approval of the parties interested is evidenced by the recognition it has received from various sources. The following resolution passed at a recent meeting of the Western Canada Live Stock Union speaks for itself:—

> "Whereas: It is desirable in the interests of the horse-breeding industry of Western Canada that in order to improve the standard of horses the services of better, pure bred sires should be made available;
>
> "And whereas: In comparison with all other schemes which have been tried, the plan now followed by the Dominion Government in giving aid in the hiring of stallions has proved, wherever adopted, to be the only satisfactory and permanent method of bringing about the results desired;
>
> "Therefore: The Western Canada Live Stock Union desires to place itself on record as recommending to all governments wishing to assist the horse-breeding industry in this way, the endorsation and encouragement of that plan."

DISTRIBUTION OF PURE-BRED STALLIONS.

As stated in a previous report, no stallions have been purchased for distribution to associations since 1916. The majority of the horses have been sold from time to time. The few that are left are loaned to associations in districts where they are greatly needed. Many of the associations have given up the stallions owned by the Branch, and formed clubs for the purpose of hiring. The community breeding idea

started by the associations has given such good results that the districts are still carrying it on, though under another scheme.

Stallions owned by the Branch have been particularly healthy, only one horse having died during the year, although these animals are placed under conditions far from being ideal. That they have proven to be good as well as sure foal getters is evident from the fact that a number of them have been sold to parties in the districts where they had stood for three and even four years. It is also evident that the value of the pure-bred sire is appreciated in these sections. The community idea carried on to-day in many districts through clubs, was started and fostered very largely by the first scheme of loaning stallions where greatly needed.

CATTLE DIVISION.

DISTRIBUTION OF PURE-BRED BULLS.

Under the distribution policy which has been in operation since 1913 pure-bred bulls owned by the Live Stock Branch are loaned to specially-organized associations in newly-settled districts and in backward sections in some of the older provinces where farmers are unable to purchase pure-bred sires for themselves. Up to the end of December, 1918, the number of bulls so loaned totalled 2,152.

In districts which have been obtaining the benefit of this policy for several seasons the improvement in the live stock is already very apparent. This form of assistance has been warmly endorsed at various farmers' meetings during the past year and letters received from secretaries of interested associations have been very appreciative. Commission men, drovers, and dealers at the various stockyards have also been very favourably impressed with the gradual improvement in the quality of the stock coming from districts which have been using the department's sires for several seasons.

It is of interest to note that when a bull's usefulness as a sire is over he is by no means a total loss to the department. During the calendar year of 1918, 325 bulls were sold for beef purposes. The net proceeds received from the sale of these bulls amounted to 66 per cent of their original cost as registered sires.

The following table indicates the total number of bulls in the hands of associations on December 31, 1918:—

TOTAL Number of Bulls in Hands of Associations.

Breed.	B.C.	Alta.	Sask.	Man.	Ont.	Que.	N.B.	N.S.	P.E.I.	Total.
Shorthorn	35	214	234	112	84	98	1	9	12	799
Ayrshire	13	2	2	.....	5	186	13	14	6	241
Holstein	11	4	6	5	12	35	2	3	1	79
Hereford	2	23	23	5	3	3	.	1	...	60
A. Angus	3	9	13	10	...	.	...	.....	.....	35
Fr. Can.	...	.....	...	...	...	36	.....	.....	..	26
Jersey	10	.....	...	...	...	...	1	.....	.....	11
Guernsey	3	....	...	...	...	...	...	2	....	5
Red Polled	...	...	2	...	...	...	...	...	...	2
Galloway	1	...	...	...	...	...	...	.....	...	1
Total	78	252	280	132	104	348	17	29	19	1,259

CARLOT POLICY.

The Live Stock Branch under the terms of the carlot policy pays reasonable travelling expenses of a farmer residing in Canada, or the authorized agent of farmers residing in Canada, purchasing stock at central stock-yards for return to country points. In Eastern Canada assistance under the policy is confined to stock-yards' purchases of female breeding stock, cattle, sheep, or hogs. In Western Canada it covers stocker and feeder cattle in addition to breeding stock.

This policy has been in effect at three stockyards in Western Canada during the past three seasons and has been instrumental in turning back to country points an increasing number of stocker and feeder cattle and breeding stock and of young ewes received at these yards. This has been particularly the case at Winnipeg. In 1915, in which year the policy was not in effect, 82 per cent of the stockers and feeders received at Winnipeg yards were shipped south. In 1916 only 42 per cent went south and in 1917 only 30 per cent; despite the fact that the total receipts of this class of cattle were 50 per cent greater in 1917 than in 1916. In 1918 the percentage shipped to the United States was greater than in 1917, due to a further increase of 20 per cent in receipts and to inability to greatly expand the absorbing capacity of Western Canada farms owing to the scarcity of feed. Nevertheless, the total number of cattle returned to Canadian points in 1918, from Winnipeg alone, was 8 per cent greater than in 1917. In addition the number returned from both Calgary and Edmonton was, last year, practically equivalent to that from Winnipeg.

During the calendar year of 1918, 2,703 steers, 18,745 heifers, 7,978 sheep, and 205 sows were purchased under the terms of the car lot policy. Since October 10, 1916, 102,150 head of cattle, sheep and swine have been shipped under its terms to farmers in Western Canada alone. The cost to the department for stock shipped back under this policy during the year 1918 averaged only fifty cents per head.

FREE FREIGHT POLICY.

The free freight policy was inaugurated in the fall of 1917 by the Live Stock Branch in co-operation with the railway companies of Canada to supplement the carlot policy in preventing, as far as possible, the slaughter or exportation of useful heifers, young ewes and young sows offered for sale on the open market at central stock yards. It has been possible under this policy to ship from the stock yards to country points female breeding stock of the classes mentioned without payment by the purchaser of freight charges on same, provided the stock was not purchased for speculative purposes.

Twenty-five per cent of the ordinary freight charges on such shipments has been borne by the railway companies and the other seventy-five per cent has been collected by the railway companies direct from the Live Stock Branch. The introduction of this policy has had a tremendous influence on trading at the different yards and, during the eighteen months that the policy has been in operation, practically all of the young heifers and ewes of good quality offered for sale on the three western yards have gone back to the country for breeding purposes. Shipments returned to country points

under the terms of the policy between the date of its inception, September 21, 1917, and March 31, 1919, were as follows:—

Name of Stock Yards.	No. of Cattle.	No. of Ewes.	No. of Sows.
Edmonton	11,996	6,231	155
Calgary	12,220	18,422	
Winnipeg	12,284	3,674	191
Toronto	1,414	7,672	
Montreal	164	452	
Total	38,078	36,451	346

RECORD OF PERFORMANCE.

Owing to the scarcity of help on the farms, the number of cows entered for the record of performance test during the summer and fall of 1918 was considerably less than would have been under normal conditions, however, more applications for entry were received during the first three months of 1919 than during the same period of any previous year.

The yearly test is now conceded to be the most reliable method of acquiring information regarding the production of milk and butter fat. Purchasers of dairy cattle in nearly all cases require to know the records of the cattle or of their ancestry. A large proportion of the male progeny of tested animals are used in grade herds where their influence cannot fail to be beneficial. This is tending to increase the average production of dairy cattle and is, therefore, fulfilling the main object of the record of performance test.

The record of performance inspectors, visiting as they do, a number of the highest producing herds in the Dominion, are in a position to obtain reliable information as to the best methods of feeding and caring for dairy cattle; this information is of great benefit to a large number of the owners of cows entered for the test, especially those who have not had considerable experience with dairying.

The following is a brief summary of the work for the year:—

Number of cows entered for the test:—

Ayrshires	568
French-Canadians	36
Guernseys	23
Holstein-Friesians	598
Jerseys	245
Shorthorns	141
Total	1,611

Number of cows qualified:—

Ayrshires	194
French-Canadians	3
Guernseys	3
Holstein-Friesians	175
Jerseys	76
Shorthorns	45
Total	496

Number of bulls qualified:—

Ayrshire	8
Holstein-Friesians	18
Jerseys	4
Shorthorns	2
Total	32

Appendix.

The records tabulated in the appendix to the annual report are for cows which have produced sufficient milk and butter fat to qualify, but which have failed to freshen within fifteen months after the commencement of the test. .

Ayrshires	43
French-Canadians	2
Holstein-Friesians	70
Jerseys	17
Shorthorns	12
Total	144

SHEEP AND GOAT DIVISION.

DISTRIBUTION OF RAMS AND BOARS.

The policy of loaning pure-bred rams and boars to farmers' live stock associations has been in vogue for six years. The assistance under this policy is extended to those districts where the farmers experience considerable difficulty in obtaining pure-bred sires or are in such a financial position that they are unable to purchase for themselves the most suitable sire. The policy of restricting an association to one breed and, further, maintaining the breed first selected, thus making the breeding in that district uniform, has been adhered to. Evidences are now apparent that this principle has brought about and is bringing the desired results. This is the basis of community breeding which has been the foundation of success in live stock centres the world over.

Since this policy has been in operation upwards of 1,800 rams and 500 boars have been bought and placed in the hands of farmers who otherwise could not have benefitted by the use of a pure-bred sire. A tabulated statement follows which gives the numbers of the breed distributed and the Provinces in which the distribution took place.

Boars.

Breed.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total.
Yorkshire	2	10	4	120	24	9	24	21	4	218
Berkshire	6	1	1	6	18	19	39	54	9	153
Poland China					1	1	9	6	1	18
Duroc Jersey						1	8	20	3	32
Chester White		5	1	37	5				1	49
Tamworth				5		2	1	1		9
Total	8	16	6	168	48	32	81	102	18	479

Rams.

Breed.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Total.
Shropshire	86	108	23	240	36	14	5	93	6	611
Oxford Down	32	222	12	110	16	57	2	107	6	564
Leicester	15	8	14	297	70	7	4			415
Cheviot	5	4	3	21						33
South Down	8	19	1	12	2				4	46
Hampshire			7	63						70
Lincoln			3	15	8					26
Suffolk						6				6
Cotswold				1	2				1	4
Total	146	361	63	759	134	84	11	200	17	1,775

In so far as the Maritime Prrovinces were concerned it was decided last year to change this policy. The Sheep Division purchased and transported to four distributing centres within the Maritime Provinces 254 rams. The provincial Departments of Agriculture took on the work of distributing these rams to sheep raisers. All the rams previously loaned to associations in Nova Scotia, New Brunswick and Prince Edward Island were sold to such farmers as were desirous of owning a pure-bred ram. Over two hundred rams were sold in this way which means that upward of five hundred pure-bred rams were placed in the hands of sheep raisers at below actual cost; the difference between cost and selling prices was borne by the Live Stock Branch.

CO-OPERATIVE MARKETING OF WOOL.

In the report of the Sheep Commissioner issued in 1911 attention was called to the poor quality of Canadian wool and the deplorable system of marketing this commodity. These two defects were given as the greatest weaknesses of the industry. Therefore, the selling of wool on a quality basis was inaugurated. This movement has grown until the local associations which were first formed combined their efforts in February, 1918, and formed a central co-operative selling agency known as the Canadian Co-operative Wool Growers, Limited, with its head office in Toronto, Ont.

Wool is collected by the various local wool growers associations or sheep breeders associations or in some instances under the auspices of the provincial Government and then graded or prepared for selling on a quality basis by a staff of graders employed by the Sheep Division. During the season of 1918 fourteen of these qualified wool graders were engaged on this work. During 1914 206,129 pounds of wool were graded for associations in four provinces. In 1918, approximately 4,550,000 pounds of wool were graded and sold co-operatively throughout the Dominion. The wool clip of Canada is estimated at 15,000,000 pounds and that portion of it which comes on the market for sale through the usual channels of dealers and wool-growers associations is 10,000,000 pounds. From this it will be seen that the wool graders graded approximately 45 per cent of this wool which comes on to the market and, further, that 45 per cent of this wool was sold on a quality basis by co-operative means.

EDUCATIONAL PROPAGANDA.

This work divides itself into two main features: (1) that of exhibts at the leading agricultural fairs throughout the Dominion and (2) practical demonstrations by representatives of the Sheep Division situated in the various provinces. An exhibit advocating co-operative marketing and grading of wool visited the larger exhibitions, including Calgary, Edmonton, Brandon, Regina, Saskatoon, Vancouver and Ottawa. Other exhibits showing the manufacture of wool in the various stages, together with the defects of wool fleece sometimes encountered in the marketing and their remedies were shown at the following exhibitions: Three Rivers, Sherbrooke, Valleyfield, Quebec, Ottawa Winter Fair, Windsor, London, Welland and Charlottetown. Experts accompanied these exhibits in order to give first-hand information on all matters pertaining to the sheep industry and the marketing of wool. In this way those virtually interested were helped.

Demonstrations in dipping, shearing, castration, docking and correct preparation of wool for the market were carried out by the various representatives stationed within the provinces. In the work of dipping a portable dipping tank was carried from one centre to another where small flocks were dipped in front of an audience of interested sheep raisers. This work was very successful. One representative dipped between 3,500 and 4,000 sheep in a period of a little over two months last summer. This would have very beneficial results especially in the province of Quebec, where a very small percentage of the sheep are dipped annually with the result that internal parasites are very prevalent and in some cases external parasitic diseases.

THE GOAT INDUSTRY.

Interest in goats is being increased each year. The goat has a place in the live stock industry in spite of the many puerile jokes which are constantly being made at the goat's expense. The milk-consuming public are now realizing the terrible percentage of tubercular milk cows and are becoming seriously alarmed. The goat is to all intents and purposes immune from this scourge, therefore, it is being used more and more for supplying milk for infants and invalids. This division has been instrumental in introducing goats as milk producers in one or two hospitals and sanitariums. Record of performance work has been extended to goats, but at the present time there are not sufficient members to make a big start. There are now four societies in Canada interested solely in goats: one national, the Canadian Goat Society, and three provincial ones, namely, British Columbia, Alberta and Manitoba. The societies in Alberta and Manitoba were formed during the year of 1918.

POULTRY DIVISION.

The work of the Poultry Division centres around, principally:—

1. The marketing of a standardized product, inspected and guaranteed.
2. The distribution of markets intelligence.
3. The encouragement of co-operation, giving despatch in collection and marketing.
4. Economic production through stock improvement.

Important assistance has also been rendered in furthering the sale of Canadian eggs and poultry in an export way, and representations made, which have resulted in improved facilities for trading between the different section of the Dominion. In light of the world-wide interest being evinced in poultry-keeping, attention has also been given to the matter of increasing the per capita consumption of eggs and poultry. Special effort was made in this direction through the medium of exhibts at fairs.

THE ENFORCEMENT OF THE EGG REGULATIONS UNDER THE "LIVE STOCK AND LIVE STOCK PRODUCTS ACT."

The egg regulations under the "Live Stock and Live Stock Products Act" became effective on May 28, 1918. For purposes of administration, Canada was divided into two sections: the western section including, and west of, Port Arthur; the eastern section, east of Port Arthur.

The following is a statement of the inspections made during the seven months ending December 31, last:—

Section.	No. inspections.	No. cases inspected.	No. shipments approved.	No. not approved.
Eastern	289	53,374	251	38
Western	180	75,998	167	13
Totals	469	129,372	418	51

The principle followed in the matter of inspection is inspection by approval at point of shipment. That is, eggs in carlots cannot be shipped for export or inter-provincial shipment unless the quality is found to be as represented, at point of shipment. The relatively larger number of shipments not approved in the eastern section is due to the fact that the eggs shipped from eastern points were, as a rule, of a much higher grade than those from the west, and the fact that the requirements of the higher grades are much more exacting than those of the lower.

The beneficial effects of the regulations are clearly apparent in two ways, first, the marked improvement in the quality of the stock shipped by the western provinces and, second, the reports coming back respecting the quality of the eggs shipped to Great Britain last year.

Previously, eastern firms bought eggs in Chicago in preference to western Canadian points. Last year, however, the fact that even seconds could not be shipped which contained more than two per cent of cracked, bad and dirty eggs, gave eastern buyers an assurance of quality which they were not able to obtain on even the largest United States markets.

In an export way, no better proof can be obtained than the satisfactory reports coming back of shipments made. A large firm in Bristol has stated that the Canadian eggs which they received last year were not only the best storage eggs but the best graded eggs which they have ever received. And following the satisfactory reports of last year and the endeavours that have been made to further the sale of Canadian eggs in Great Britain this year, the prospects for an enlarged and important demand from Great Britain are very bright.

EGG AND POULTRY MARKETS REPORTING.

During the year this work has progressed apace. The results are now clearly evident. During the past year more eggs have been sold throughout the Dominion than ever before. The custom in the past has been for producers, country shippers and others to take whatever price was offered, but now with definite, tangible information in their hands of what the prevailing prices are on all principal markets, of what the trend of trade is, these people have been able to make up their mind as to the price their product should bring, and instead of accepting what was offered, have sold their eggs for what they thought they should get. Naturally, such a condition has had a distinct reflection in the attitude of producers and original shippers toward the poultry business and has emphasized its comparative profitableness to them as a part of their activities. The situation with respect to the poultry business throughout the country never was more favourable. Outside of some districts in theWest and in the non-producing areas of the East it is estimated that farmers are keeping over this year from twenty-five to thirty per cent more females than last. Prices are very favourable and there is the satisfaction in feeling that with the assistance being given, the producer is obtaining more and more his just proportion of the ultimate selling price.

At present the Weekly and Daily Egg and Poultry Markets Reports are issued from Otawa only. These, by mail, do not reach producers and shippers in Saskatchewan, Alberta and British Columbia until after four or five days, by which time most of the information is too old to be of the greatest advantage. The logical solution is to issue these reports simultaneously from several different centres. Plans for this purpose are already under consideration, and steps in this direction will be undertaken at an early date.

CO-OPERATIVE MARKETING.

From holding the reputation of a few years ago of offering for sale possibly the poorest eggs, the province of Prince Edward Island has attained the place where it is recognized as offering to-day the best eggs obtainable in carlots in the Dominion. This condition has been brought about primarily by a system of co-operative collection and marketing, the foundation of which was laid by the Live Stock Branch, in conjunction with the provincial Department of Agriculture, some six years ago. Further, the inspectors' report on the eggs for export put up by the Dundas Co-operative Association in Ontario is to the effect that there are not grades high enough in the present standards prescribed by the regulations to accommodate the quality offered. No means have yet been devised equal to co-operative movement to stimulate prompt delivery, frequent marketing, and despatch in moving the eggs from the point of lay to point of storage or consumption, and having in mind the important place which such activities must have in raising the quality of the product throughout the Dominion, it is clear that all legitimate assistance possible should be extended to the organization of co-operative egg and poultry shipping organizations. With this end in view an increased appropriation is being asked for this year.

POULTRY STOCK IMPROVEMENT.

High class utility stock is the basis of all national improvement. While it is true from the standpoint of quality that eggs as laid are one of the most uniform products in nature, increased volume is largely a matter of breeding and selection. There was a time when trap nesting was about the only means available to indicate the productiveness of individual birds. In the last few years, however, both experiment stations and individuals have demonstrated that high producers can be separated from non-producers by the application of comparatively simple and authenticated tests. In other words, in the culling demonstrations that have been given on some hundreds of farms during the past year it has been clearly proven that it is possible to take out from 40 to 60 per cent of the stock in the average farm flock and still leave the farmer with as many eggs per day as he was getting before. No line of work previously undertaken has done more to impress upon the individual producer the economics of good stock and rigid selection.

Poultry breed quickly and are a class of live stock the entire complexion of which can be changed nationally in a comparatively few years. Extensive investigation has shown that high productiveness is largely a sex limited characteristic. The male constitutes more than 50 per cent of the flock. It is conceded, therefore, that any effort directed along these lines should have to do primarily with the selection and approval of the male birds.

The department has under consideration a scheme of national registration and approval whereby individual effort along lines suggested may be fostered and encouraged. The foundation for this work has been effectively laid in certain parts of the Dominion, and it is possible that important announcements in reference thereto may be made during the present year.

EXHIBITS.

The exhibits work carried on by the Poultry Division during the past few years was further amplified and extended last year, the principal addition being a large new exhibit featuring greater production and increased consumption of poultry products. A feature of this exhibit was the attractive display in glass cases of wax and plaster cast imitations of many of the principal ways in which eggs and poultry are utilized as food. This exhibit toured all of the larger exhibitions from coast to coast.

For some time there has been a growing feeling that the exhibits' work as carried on should illustrate more and more the phases of work actually underway and constitute as it were, a medium for bringing the different lines of work more definitely before the public. To this end a smaller exhibit, featuring the four principal activities of the Poultry Division, as outlined in the opening paragraph, was prepared. This exhibit made the circuit of many of the smaller fairs and poultry exhibitions in eastern Canada. In addition, the extensive exhibit prepared the year previous illustrating co-operative marketing has been used wherever opportunity offered, and at the Guelph Winter Fair last year there was erected a full-size cross section of a model for an ice-cooled chill room suitable for the pre-cooling of eggs and dressed poultry at country shipping points.

Owing to the increasing demand for these exhibits from year to year, and the fact that much of the improvement that has taken place in the quality of eggs marketed may be directly attributable to this work, it is planned to use this medium even more extensively in the future in featuring the different aspects of the work carried on by this division.

THE MARKETS DIVISION.

In order that the producers of live stock may market their surplus stock to the very best advantage, the Markets Division places at their disposal a reliable and unbiased source of information as to the conditions under which their animals are marketed. Producers are supplied with reliable knowledge as to supply and demand so that they may better regulate the movement of their stock to the market, thereby ensuring an even volume of receipts on market days, precluding congestion, scarcity, and wide price fluctuations; they are informed as to general conditions of feed and pasture, as to the world's supply and distribution of live stock, and on other subjects either directly or indirectly influencing the marketing of their stock. The ultimate aim of the division is to provide the producers with every facility in as far as a knowledge of markets and marketing is concerned thereby placing them on an equal footing with the trade.

As the public stockyards are the centres where supply and demand are best indicated, and where an index to general live stock conditions can best be secured, representatives of the branch are stationed at all the large central livestock yards in the Dominion. These men, specially selected for the work, classify all live stock offered for sale, according to quality, ascertain the point of origin of the stock from each province, record actual sales, ascertain average prices and report on the conditions under which sales are made. This information is forwarded to Ottawa by mail and telegraph, and is recorded, co-ordinated, edited, and used as a source from which a weekly market news service is derived. This service consisted during the past year of reports covering the grading, average price, price range for the bulk of sales, and top price of all live stock marketed at the stockyards, situated at Montreal, Toronto, and Winnipeg, together with weekly comments in detail on supply, demand and distribution of the live stock after selling whether to the packer and butcher trade, shipment back to country points, or on export account. A table of receipts at the leading stockyards for comparative periods was also appended. In addition market comments dealing with the live stock transactions at the Calgary and Edmonton yards were prepared and included in the weekly service. This service was distributed through co-operation with the farm press and through a mailing list confined to persons directly interested in the live stock industry. During the year, the list was increased by over 100 per cent, chiefly through personal inquiry. Monthly and annual statistical statements followed up the weekly reports.

That this service is appreciated is manifested by the fact that many of the leading agricultural journals in the country have given preference to the departmental reports, over the information they formerly published. The weekly news letter and statistical table are now a regular feature of the live stock section of many of the most important farm journals, and occupy a place in the library of representatives of official agriculture.

During the year, the division was able to bring up to date, the large amount of statistical data as to the point of origin, grading, and quality of every head of stock sold at a public stockyard during the past three years. This information is compiled by counties in Ontario and Quebec, and by definite areas in the Prairie Provinces, and is now complete for the years of 1917 and 1918. On January of the present calendar year, statements as to the marketings from the various provinces by counties and areas were prepared and mailed to the farm press, to agricultural representatives, official agriculture, and to officers of the branch situated at the stockyards. These statements have taken various forms and following is one which deals with the question of the percentage of steers suitable for export alive or dressed, marketed from Ontario during the month of March, 1919.

ONTARIO Produced Live Stock marketed at a Public Stockyards with percentages of Export Quality, by counties, March, 1919.

	Cattle.		Calves.		Hogs.		Sheep.	
	Total Cattle.	Per Cent. Export Steers.	Total Calves.	Per Cent. Beef Bred.	Total Hogs.	Per Cent. Good Bacon.	Total Sheep.	Per Cent. Good Grade.
Algoma	13	Nil	Nil	Nil	192	83·8	Nil	Nil
Brant	567	Nil	71	39·0	97	99 0	40	80·0
Bruce	1,423	6·18	8	75 0	706	97 6	45	56·0
Carleton	317	22 4	38	Nil	270	98 9	24	59 5
Dufferin	998	8 9	19	89·0	1. 04	89·2	46	61·0
Dundas	35	Nil	468	Nil	198	90 9	3	100·0
Durham	895	1 9	861	3·2	627	94·2	97	59·0
Elgin	190	12 1	300	14 0	637	93 4	19	31·2
Essex	29	Nil	20	35·0	338	93·2	2	100·0
Frontenac	Nil	Nil	14	14·3	75	84 0	Nil	Nil
Glengarry	58	Nil	193	Nil	254	72 7	18	89·0
Grenville	99	Nil	670	Nil	141	82 8	85	0·0
Grey	2,693	10 5	47	7 2	3,556	94·3	260	66·1
Haldimand	317	Nil	27	18·5	Nil	Nil	Nil	Nil
Halton	881	15·5	145	44 1	1,079	95 6	195	72·6
Hastings	350	5 6	556	11·3	809	92·5	26	65·1
Huron	1,688	11 0	56	53 5	1,230	96·5	151	74 2
Kent	675	8·0	28	57 1	789	88 9	69	73 9
Lambton	101	6 0	8	75·0	97	91 8	Nil	Nil
Lanark	508	18·3	19	16 8	407	88 3	23	50·0
Leeds	85	Nil	673	1 3	1,257	80·1	25	86 0
Lennox and Addington	44	Nil	198	18·7	55	58·1	30	92·6
Lincoln	19	Nil	14	35·7	Nil	Nil	4	100·0
Middlesex	282	15·2	25	24 0	498	95·7	60	75·0
Muskoka	36	Nil	Nil	Nil	42	100 0	Nil	Nil
Nipissing	11	Nil	Nil	Nil	88	84 0	29	100·0
Norfolk	125	1 0	54	22	276	98 5	84	88 0
Northumberland	423	Nil	159	18·9	644	95 4	60	71 8
Ontario	1,704	8·2	107	50 4	389	96 2	123	91·8
Oxford	1,186	1·0	981	6·2	504	94 7	92	70 0
Parry Sound	18	Nil	7	28 5	306	54 5	46	80·4
Peel	903	8·2	262	50·7	1,842	95 8	202	61 3
Perth	1,721	8 9	211	9·0	902	91 1	89	75 0
Peterboro'	656	1	133	46 6	18	99 0	46	78 0
Prescott	Nil	Nil	Nil	Nil	Nil	Nil	10	100·0
Prince Edward	147	Nil	133	9·8	237	74·2	26	58·0
Renfrew	294	14·4	76	1·3	258	78 0	36	31 0
Simcoe	2,130	2 8	131	81·6	4,912	94 3	256	83·9
Stormont	37	Nil	1,663	Nil	663	84 7	2	Nil
Russell	4	Nil	2	Nil	115	68·7	2	Nil
Victoria	591	6·7	30	66·6	344	95·4	35	85·7
Waterloo	957	10 1	337	3 2	742	91·1	25	96·0
Welland	150	Nil	11	45·5	1	85·6	Nil	Nil
Wellington	2,931	9 0	71	39·0	2,336	95·6	404	80·6
Wentworth	249	8·4	22	9·0	191	95·8	Nil	Nil
York	2,248	3·9	280	45·0	1,676	92 8	458	81 0
Totals	28,898	Av. 7 0	9·27	Av. 11·9	31,235	Av. 92·2	3,256	72 3

In view of the energetic programme in force to enchance the production and quality of our live stock and live stock products, in anticipation of an increased export trade in the same, information such as the preceding, regarding the marketable stock of the Dominion, is of considerable value. It has already received editorial attention from the farm press, as also appreciation from others interested in the advancement of the live stock industry. Intelligence of this character is now available for public use, and can be obtained either at the branch or at the offices of the branch situated at stockyards within the provinces.

In addition to having secured information bearing directly on the marketing of live stock, the officers of the division supervised the operation of the carlot and free-freight policies of the branch, as outlined under the report of the Cattle Division, and placed their services at the disposal of those requiring assistance in purchasing and shipping live stock. It is not too much to say that the very favourable increases in the condition and quality of the live stock population of the Prairie Provinces during the past two years, have been due in no small degree to the good work done by the representatives of the branch of the Winnipeg, Calgary, and Edmonton stockyards.

The officers of the branch at the yards are becoming recognized as bureaus of market information, and the officers are at all times ready to aid and direct farmers visiting the market and requiring advice and assistance. In fact this departmental representation is much appreciated and is now considered as performing an indispensable function in facilitating the purchase and sale of live stock at the stock yards, and, as well, at country points.

The staff at the branch, employed to prepare for record and publication, the information received from the centres of trade, has been augmented during the year in order to take care of the increasing volume of information.

A noticeable point in connection with the year's work was the volume of inquiries received from the trade and from producers for information dealing with all phases of the situation as regards domestic and foreign live stock and live stock products. Having made provision during the year for keeping such information up-to-date and readily available, the division is in a position to handle an extensive inquiry department, dealing with the live stock industry and markets of the other large meat exporting countries of the world, as well as with those of the Dominion.

FEED DIVISION.

During the year this division has continued with the work of purchasing concentrated feeding stuffs, and their distribution to districts where the feed shortage was most acute. This service, which was commenced last year, has proven very popular and orders for car lots of feed were received from all parts of the Dominion. In this way a considerable quantity of feed was disposed of and the live stock industry has benefited materially as a result. With the signing of the armistice, the demand eased off slightly, due partly to a popular impression that there would be a speedy decline to pre-war values, which resulted in a disposition on the part of many feeders to curtail expenditures until lower levels had been reached. However, while prices weakened somewhat,

and concentrates were available at lower prices, this was only a temporary relief, and values soon advanced to higher levels.

Aside from bran and shorts, the feeds most in demand were corn, oil cake and screenings (standard stock feed). This division did not undertake to handle mill feeds, these being left entirely with the trade to distribute, but the following quantities of corn, oil cake and screenings were sold:—

Corn.	Oil Cake.	Screenings.
4,364 tons.	3,956 tons.	5,145 tons 1,568 lb.

It will be noted that this represents a tonnage of 13,465 tons 1,568 pounds, the money value of which was approximately $657,483.

As the practice of purchasing and distributing feeds was adopted as a war measure, it is intended to discontinue this work as soon as present stocks are depleted.

DOMINION EXPERIMENTAL FARMS AND STATIONS.

Despite the difficulties caused by shortage of labour and by the absence of many of the trained officers of this branch, on active service overseas, it was found possible to carry on effectively all the main lines of investigation and experiment and, in addition, to do a considerable amount of special work, either directly connected with Canada's war effort or arising from war conditions.

In animal husbandry, the shortage of such concentrates as bran, shorts, oil cake, etc., and their high price brought up a number of new problems in feeding. In field husbandry, labour shortage led to a more intensive study of labour-saving devices. Every effort to encourage poultry keeping, gardening, etc., was made. In the Division of Chemistry a large number of analyses were made of materials purchased for army and navy use. In the Division of Forage Plants the special work of root seed production took up a great deal of time and attention and was successfully carried on. With flax, under the stimulus of small European production and insistent war demand, a good response was made to efforts to increase fibre flax production. Successful trials of a flax pulling machine were made. Large shipments of fibre flax-seed were made to Ireland at the request of the Imperial authorities.

While no new experimental stations were established during the year and only a limited amount of building work was done, owing to high cost of materials and scarcity of labour, the superintendents of the branch farms and stations, many of whose assistants were overseas, could cope with the work only by the most strenuous endeavours.

Altogether, then, the year was a very busy one throughout the experimental farms systems.

During the year the following reports, bulletins, pamphlets, and circulars were sent to press:—

Annual Report of the Experimental Farms, 1917-18.

Bulletins, Regular Series—
- No. 91, Poultry Feeds and Feeding.
- 92. The Strawberry and its Cultivation.

Bulletins, Second Series—
- No. 34. The Rearing of Rabbits.
- 35. Tomato Diseases.
- 36. Feeds and Feeding.
- 37. Peach Canker.

Pamphlets—
No. 17. Fish Meal as a Live Stock Food.
18. Recleaned Elevator Screenings as a Food for Live Stock.
19. How to Make and Use a Hot-bed and Cold Frame.
20. Some Varieties of Tobacco Recommended for the Province of Quebec.
21. Construction and Care of Tobacco Seed-beds in the Province of Quebec.
22. Tomato Culture.
23. Cabbage and Cauliflower Culture.
24. Asparagus, Celery and Onion Culture.
25. Bean Anthracnose.
26. Melon Culture.
27. Cultivation of Some Staple Vegetables.
28. The Rod Cultivator.

Special Circulars—
No. 17. Ensilage in 1918.
18. When Should Potatoes be Planted to Obtain Maximum Crops?
19. The Importance of Planting Good Seed Potatoes for high Yields.
20. Flax for Fibre; the Canadian Farmer's Opportunity."

Regular Circulars—
No. 15. Selecting and Wintering Biennial Vegetables for Seed.
16. Best Varieties of Grain.
17. Every Gardener his own Seed Grower.

Nos. 11, 12, and 13 of "Seasnable Hints" were issued and 139 press articles.

Seeding was completed early in 1918, but, in the West, was followed by cold weather and heavy frost in May and dry weather with high winds in June. Large areas had to be resown. The drought continued in July with frosts in the latter part of the month. In the eastern provinces conditions were favourable although rains at harvest time caused delay and some damage to crops, especially in the province of Quebec.

For 1918 the total area under field crops is estimated at 51,427,190 acres, an increase of 8,824,902 acres over 1917. The acreage sown to wheat was the largest on record, 17,353,902, giving an average yield of 11 bushels per acre, 4¾ bushels per acre less than 1917.

A new high mark was set for the total value of Canada's field crops, namely, $1,367,909,970, an increase of $23,273,520 over the total value for the previous year, which was itself a record.

Some figures on the total and average yields and values of our principal field crops are given:—

Areas and Estimates of Yield and Value of Field Crops, 1918.

Crop.	Area.	Yield per Acre.	Total Yield.	Weight per measured bushel.	Average Price per bushel.	Total value.
	Acres.	bus.	bus.	lb.	$	$
Fall Wheat	416,615	19·00	7,942,800	61·19	2·08	16,516,000
Spring Wheat	16,937,287	10·75	181,132,550	58·69	2·02	365,151,700
All Wheat	17,353,902	11·00	189,075,350	59·44	2·02	381,677,700
Oats	14,790,336	28·75	426,312,500	35·61	0·78	331,357,100
Barley	3,153,711	24·50	77,287,240	47·24	1·00	77,578,570
Rye	555,294	15·25	8,504,400	56·60	1·49	12,728,600
Peas	235,976	13·25	3,099,400	59·93	2·51	7,873,100
Beans	228,577	15·50	3,563,380	58·67	5·41	19,283,900
Buckwheat	548,097	20·75	11,375,500	47·41	1·58	18,018,100
Mixed Grains	921,826	38·75	35,662,300	46·39	1·14	40,736,500
Flax	1,068,120	5·75	6,035,200	53·72	3·13	18,951,000
Corn for Husking	250,000	56·75	14,214,200	53·97	1·75	24,902,800
Potatoes	735,192	142·00	104,364,200	.....	0·98	102,235,300
Turnips, Mangels, etc	325,037	377·50	122,699,600	.....	0·43	52,232,000
		tons.	tons.			
Hay and Clover	10,544,625	1·40	14,772,300	.....	16·25	241,277,300
Fodder Corn	502,069	9·50	4,787,500	.....	6·15	29,439,100
Sugar Beets	18,000	10·00	180,000	.....	10·25	1,845,000
Alfalfa	196,428	2·25	446,400	.....	17·84	7,963,500

NUMBER of Farm Live Stock in the Dominion, 1914-18.

Live Stock.	1914.	1915.	1916.	1917.	1918.
Horses	2,947,738	2,996,009	3,258,342	3,412,749	3,609,257
Milch Cows	2,673,286	2,666,846	2,833,433	3,202,283	3,543,600
Other Cattle	3,363,531	3,399,155	3,760,718	4,718,657	6,507,267
Sheep	2,058,045	2,038,662	2,022,941	2,069,358	3,052,748
Swine	3,434,261	3,111,900	3,474,840	3,619,382	4,289,682

EXPERIMENTAL STATION, CHARLOTTETOWN, P.E.I.

Seeding commenced in Prince Edward Island late in April and was finished early in May under favourable conditions. The growing season was excellent for grain crops which gave heavy yields; hay was rather below the average due to cold, dry weather in May and June. Fruits were a light crop as were also vegetables. Roots were below the average yield. Potatoes suffered severely, in unsprayed districts, from Late Blight and there were serious losses from rot.

To stimulate interest in poultry keeping an egg-laying contest was started in the autumn and will be continued for a year. Marked interest in the results is being shown.

A considerable amount of mangel and turnip seed was produced and twenty acres were devoted to growing stecklings for root seed production in 1919.

A permanent poultry house and a number of portable houses were built during the year.

EXPERIMENTAL STATION, KENTVILLE, N.S.

The bright weather during April and May, with light rainfall, favoured seeding operations and hastened fruit tree bloom by from two to three weeks over 1917. Precipitation during the early growing season was rather light but a good hay crop was gathered. Cereals grew and matured well but wet weather at harvest gave trouble and did some damage. Corn for ensilage was a fair crop and roots very good.

About fifteen tons of turnip seed was grown, also a small quantity of mangel seed. Thirty-four acres of stecklings were grown and stored.

A piggery 60 feet by 18 feet was put up.

EXPERIMENTAL FARM, NAPPAN, N.S.

Seeding commenced on May 15. June and most of July were cool but the fine weather of August gave a good opportunity for hay-making. There were several severe frosts in early September, which injured garden crops and a heavy rain-storm on the 21st, with high tides broke the dykes in many places and did much damage to hay on marshes.

The average yields on the farm were wheat, 24 bushels 25 pounds per acre; oats, 26 bushels 27 pounds; barley, 38 bushels 45 pounds; mixed grain, 39 bushels. The

average yield of roots was 883 bushels per acre, and potatoes 255 bushels 35 pounds. Upland hay yielded 2 tons 106 pounds per acre. The yield of marsh hay was low owing to the dykes breaking several times during the season.

Four tons of turnip seed was grown and 10 acres sown for steckling production.

The new piggery was completed during the year and considerable fencing, draining and roadwork done. About 600 feet of new dyke was built and much repair work done on the old dyke.

EXPERIMENTAL STATION, FREDERICTON, N.B.

The winter of 1917-18 was the coldest and stormiest on record. Snow disappeared rapidly towards the end of March leaving abundant moisture in the soil. May was warm and favourable for spring work but June brought frosts with considerable crop damage. Harvest conditions were favourable up to September 11, when wet weather prevailed up to the end of the first week in October.

The pure-bred herds of dairy Shorthorns, Ayrshires and Holsteins increased naturally during the year. Some good milk records were made and in the grading-up experiments the heifers generally showed improvement over their dams. A good crop of lambs was raised and the flock of Angora goats increased by ten kids. The work with swine, poultry and bees, was continued successfully.

In field husbandry, oats yielded 33⅔ bushels per acre, the crop being damaged by flooding. Three acres of wheat yielded 70 bushels; winter rye, 20 bushels per acre and field beans 10 to 24 bushels, according to variety. Turnips yielded from 17 tons to 9½ tons per acre, mangels 14 tons 1,868 pounds and carrots 136 to 380 bushels. Hay gave slightly over 2 tons per acre. Ensilage corn was practically a failure, owing to late sowing.

The regular experimental work with cereals, forage crops, fertilizers, fruits and vegetables was carried on.

Almost half a ton of turnip seed was produced and 12 acres of stecklings grown, also a half acre of flax for fibre which was shipped to Ottawa for treatment.

Experimental work with potatoes was continued, including tests of varieties, study of diseases, sprays, insecticides, etc.

A root cellar, 25 feet by 30 feet, was built, considerable stone was removed from the fields and stumping and brushing done. Five acres were tile drained.

EXPERIMENTAL STATION, STE. ANNE DE LA POCATIERE, QUE.

After the most severe winter of many years snow disappeared about April 20, although the ground remained frozen and rainy weather following prevented work on the land until May 18. May, June and July, gave twice the usual rainfall, hindering seeding and cultivation. Hay was saved in good condition in August but the grain harvest was carried on with difficulty in rainy weather. Roots and potatoes were saved in good condition.

Fourteen draught horses, including 5 registered Percheron mares, were kept on the station and some interesting figures as to cost of production of colts were gathered.

In dairy cattle Ayrshires is the breed kept, and considerable experimental and cost of production work was carried on. A herd of Yorkshire swine and of Shropshire sheep is being formed. The work with poultry was hampered somewhat by lack of help and feeds.

Some interesting data in honey production, wintering of bees, etc., were secured.

In field husbandry three rotations are carried on of three, four and five years' duration. On these Marquis and Huron wheats yielded at the rate of 43 bushels 4 pounds and 44 bushels 55 pounds per acre, respectively; Banner oats 72 bushels and Daubeney 67 bushels per acre; and Arthur peas 30 bushels 22 pounds.

In horticulture the tests of varieties were materially reduced this year. The severe winter of 1917-18 proved very destructive to the fruit trees. Twenty-five acres were devoted to steckling production and a good crop was gathered. An acre of flax for fibre was grown and the crop shipped to Ottawa for treatment.

Considerable repair work was done on the station buildings and the calf barn was finished. Several thousand feet of drain tile were laid and 1,200 rods of fencing put up. A large quantity of stone was gathered from the fields and a good amount of roadwork done.

An exhibit of station products was made at six points, a number of excursions to the station were entertained, as well as several thousand visitors coming individually in small groups.

EXPERIMENTAL STATION, CAP ROUGE, QUE.

The growing season in central Quebec was cooler, with more sunshine and greater precipitation than the average for the past seven years. The hay crop was a very good one, cereals gave a fair yield, while corn for ensilage and field roots gave a poor return.

With dairy cattle the experimental work in grading up, experimental feeding and experimental housing was continued. With horses, the main lines of experiment were in breeding, colt raising, feeding and housing. The work with sheep and poultry falls under similar headings of feeding, housing, and breeding.

In field husbandry the work comprised the gathering of figures as to cost of production, comparison of rotations, rates of seeding, soil management and agricultural engineering.

The usual work of testing varieties of cereals, forage plants, vegetables and fruits was carried on, as well as a series of special fertilizer experiments.

The new calf barn was completed during the year.

EXPERIMENTAL STATION, SPIRIT LAKE, QUE.

The spring weather at this station was cold and wet. Frost was registered every month except July. A severe frost on August 18 destroyed almost all crops.

The yield of hay was fairly good and was harvested in good condition.

EXPERIMENTAL STATION, LENNOXVILLE, QUE.

Ploughing commenced on April 15 and seeding on April 30. Favourable weather in May permitted the finishing of seeding operations early. Wet weather prevented

haying until the latter half of July, but the crop was a good one. The season for corn was too wet and damage was done by frost in August and September. Yields of grains and roots were very fair.

A beginning was made this year in establishing a herd of dual-purpose Shorthorns. The flock of sheep numbered 63 head, pure-bred Oxfords and Oxford grades. The wool clip sold for $328.33. A herd of swine was started, six young registered sows and a boar, all Yorkshires, being received from the Central Farm.

In horticulture the very cold winter of 1917-18 caused a great deal of winter-killing, and the cold, backward summer following was conducive neither to recovery from winter injury nor to good yields.

Excellent progress was made with the buildings and general farm improvements. A deep well pump and pneumatic tanks were installed to deliver water to all the buildings from the artesian well drilled last year. A considerable amount of roadwork was also done. The dairy building was completed and also the poultry administration building. A new piggery and some poultry colony houses were put up and some repairs and remodelling done to the dwelling houses on the station.

EXPERIMENTAL STATION, KAPUSKASING, ONT.

April, 1918, gave excellent weather for spring cultivation but was followed by a very cold and stormy May. Seeding began May 30 but, owing to bad weather, was not finished until June 20. The months of July, August, and September were unfavourable to growth and the autumn rains greatly hindered fall ploughing.

Fall wheat and rye sown in 1917 gave yields of 30 bushels and 22 bushels per acre respectively. Spring wheat did not mature nor did barley. Oats matured on summer fallow but were a poor yield. Grains which did not mature were cut for ensilage and proved excellent for the purpose.

A dairy herd of Ayrshires and Holsteins and a beef herd of Shorthorns were established and a start made with hogs and sheep. A milking machine was intalled in the dairy barn.

One hundred acres were stumped, fifty acres slashed and 13 broken for crop during the year. A large quantity of logs were cut and sawn into lumber for the station buildings of which a cottage, boarding house, silo and temporary piggery were built.

General improvements effected include a mile of roadmaking, 4,000 feet of tile laid, 430 rods of wire fencing put up and one-half mile of sidewalk laid.

EXPERIMENTAL STATION, MORDEN, MAN.

After the severe winter of 1917-18, spring opened early and some seeding was done in the district before the end of March. April was warm but with high winds which caused soil drifting and destroyed large areas of spring wheat. Severe frost in May killed vegetation to the ground. In spite of these drawbacks, however, the yield of cereals was good and the quality excellent.

No experimental or breeding work with horses or cattle has yet been started at this station. The grading-up work with sheep was continued and noteworthy results are being obtained.

Horticulture is a main feature of the work at this station and the 90 acres allotted thereto were all taken up with orchard or garden in 1918. The orchards were greatly extended, some 1,200 young trees being set out. Large areas of vegetables were grown. Potatoes in field lots yielded over 500 bushels per acre. Beans gave 20 bushels per acre. The possibility of producing seed of many vegetables with profit was clearly indicated.

During the season a sheep shed, an implement shed and a silo were erected. Some work on the roads was done and the fencing put in first-class condition.

EXPERIMENTAL FARM, BRANDON, MAN.

The season of 1918 was the poorest, from a crop production standpoint, in the history of the farm, with the possible exception of one of the seasons in the 80's. The spring of 1918 was very early and crops started well, but were damaged a great deal by high winds. Little moisture remained in the soil from 1917. The rainfall was very deficient, which, combined with excessive wind, made all crops light. Though the rainfall was greater than in 1917, crops showed drought effects to a much greater degree, as it was the second year of drought and other conditions were unfavourable.

No experimental feeding was done with horses, but a record of feed used by each horse was kept, and it was found that the cost of feeding a working gelding for a year at present feed prices was $190.39.

Milk records of the dual-purpose Shorthorns were not as high as usual owing to poor pastures and lack of best grades of winter feed resulting. The demand for young stock of milking strain is still very keen, and several bull calves were sold to farmers. The cost of raising a calf to one year of age and of feeding a mature cow was determined, though the latter cost varies according to the cow's milk production. Results of experiments in rations showed that much cheaper and better growth resulted from a ration in which succulent feed (corn silage) was the principal part and the grain portion small.

Experiments in the cost of feeding sheep were carried on, and the grading experiment, which was begun in 1911, was completed. The object of the experiment was to demonstrate how quickly and easily improvement and uniformity could be obtained through the continued use of good rams of one breed. This flock is being used in a breed test for the production of market lambs, and crossing with other breeds carried on.

The cost of feeding a mature sow for one year was found to be $41.40 and the cost of raising a young sow from weaning to one year was $29.74. Results of experiments showed that recleaned screenings are fully equal to barley for finishing pigs for the market. In the experiments with hog pastures it was demonstrated that the cost of feeding growing pigs could be reduced at least 25 per cent by the use of rye, oats and barley, and rape as pastures.

Pullets have been trap-nested and records kept of egg production. Selection of the best laying hens for breeding purposes is practised.

Three colonies of bees were wintered over. The dry season was not favourable for honey production, but a fair amount was gathered.

Several rotations were under test. The average cost per acre of operating these rotations and the average return per acre with the resultant profit were determined. Several cultural experiments were tried and much data gathered.

In cereals variety tests were conducted, and for the first time since the introduction of Marquis wheat it has been excelled by Red Fife. This was due to the peculiarity of the season, which favoured late varieties. Victory oats gave the highest yield, but Banner has the highest five-year average with Gold Rain a close second. Two-rowed varieties of barley excelled six-rowed, Charlottetown No. 80 standing first. In five-year averages Manchurian has the highest yield. Tests of peas, flax, and rye were also conducted.

Late rains helped the forage crops, of which corn and roots were a fairly good crop. Alfalfa withstood the drought best of any hay crop and Brome grass best of the grasses. Among crops for green feed, oats gave the best results.

Variety tests of vegetables were carried on and the most suitable ones for use in Manitoba determined. Cultural tests were also made and many annual and perennial flowers tested. Experiments were continued in the growing of fruits suitable for Manitoba.

Several exhibits were sent to fairs in the province, and the championship for best bacon pig, any breed, was won; also the reserve championship for Canadian-bred Clydesdale mare. On "Farmers' Day," July 11, approximately 2,500 people visited the farm, and several other picnics and deputations during the year came to see the farm.

EXPERIMENTAL FARM, INDIAN HEAD, SASK.

The season opened early, beginning on March 28, though subsequent high winds, lack of rain and summer frosts, were unfavourable to cereal and forage crops. Pasture and hay crops were very light.

Experiments to determine cost of wintering horses were conducted. The Shorthorn dual-purpose herd is very promising.

Sheep breeding was most successful, data as to feeding costs, in wintering pure-bred and grade sheep, were gathered. Surplus stock of young, pure-bred boars was readily disposed of, and the daily cost of wintering sows outside was determined.

Poultry breeding is gaining interest throughout the province. Two breeds only were kept at the farm.

Field husbandry experiments were mainly rotation and cultural, four rotations being considered. Variety tests of cereals were conducted and results were good, excepting flax, which was a total failure. The yield of corn for ensilage was normal, but root crops suffered from winds and lack of moisture. The season was unfavourable for investigational work with clovers and grasses.

Fruit crops were practically a failure on account of frosts. The vegetable garden was almost destroyed by hot winds on June 10. Potatoes were average as to yield and quality.

EXPERIMENTAL STATION, ROSTHERN, SASK.

The season of 1918 was deficient in moisture, especially during the latter part. This led to considerable soil-drifting on summer-fallowed or fall-ploughed land and resulted in light hay crops. Grain and root crops were average. The low temperature of 30·6 on July 25 shrunk up the winter rye, which yielded an unusually poor crop.

As there are sixteen horses for regular farm work and two extra for the garden, the station has ample horse-power requirements. A creditable nucleus for a good dairy herd is at present under way. The steers purchased in the fall and sold in April or May have brought good profit. An experiment in feeding roots to steers proved that the roots have a feeding value of $18 per ton. We have now a much larger flock of sheep than the one we began with. They are also of much superior quality. A start was made in hogs in the Autumn of 1917 by obtaining six sows and one boar which, for the year, brought in a total of $1,475.

Owing to many of the trial plots in grain being blown out or buried, very little was accomplished in deducing comparative yield of different varieties. However, Marquis and Red Fife wheat, Gold Rain, Twentieth Century, Banner, O.A.C. No. 72, and Victory oats were the leaders in yields. The comparative yields of barley were very different from former years, as in 1918 O.A.C. No. 21 was eighth on the list instead of first as formerly.

The extremely dry season of 1918 prevented accurate determination of results of rotation of crops, owing to hay and corn returns being unusually low, whereas, in wet seasons, hay returns alone are usually greater than the grain.

Owing to the lack of uniformity in the quality of the plots chosen for cultural investigations, very few results were obtained. The effect of barnyard manure to summer-fallow on the following wheat crop showed an increase of 14½ bushels per acre.

Although the hay crops were not up to the standard, yet the effect of the grass in binding the soil in soil-drifting districts is a very important consideration. Mangels, sugar-beets, and carrots do not give satisfactory yields, but turnips have yielded well every year.

In 1918, the trees and shrubs had fully recovered from the set-back they received on account of the hailstorm in 1916. The new growth, however, of shrubs and the more tender trees was not sufficiently strong to withstand the early September frosts. The Caragana forms the most effective wind-break, although the Russian poplar and maple serve the purpose fairly well.

Experimental work has been under way to determine a hardy apple with a good quality. The first characteristic has been attained, but these varieties have not yet come into bearing. The fact that many farmers of the district have been growing plums for a number of years indicates good possibilities for the development of plum culture. The small fruits have yielded profitably every year since 1914.

Cabbage, cauliflower and celery yielded well in 1918. Although there seems to be considerable difficulty in the growing of celery yet we have been successful for the past seven years. Owing to the blight of the blossom of tomatoes due to cool nights, this crop seems to be generally doubtful. With the exception of one variety, Peep o' Day, the corn was a failure.

EXPERIMENTAL STATION, SCOTT, SASK.

Owing to spring opening favourably, seeding commenced early, but subsequent winds caused excessive evaporation and soil drifting, injuring young plants. The drought continued until late in July, when there was one heavy rain. Frosts damaged wheat on July 24 and 26, and in September there was drought and frost, making crops the lightest in the history of this part of Saskatchewan.

One team of young geldings has been sold at a good figure and data gathered on cost of feeding work horses and raising horses. Nineteen steers were sold at a net profit of $17.77 each. Feeding experiments were conducted and value of dehorning proved. Good returns were made on sheep. Experiments consisted of grading up, using range ewes and Shropshire rams for foundation stock. Feeding experiments were also carried on. Gains were determined in feeding swine with self-feeders *v.* open troughs. Seventy-one fat hogs were marketed and one boar sold.

Comparisons were made with hens *v.* early pullets for egg production and fertility of the eggs. It has been found that March and April hatched birds are best for winter eggs.

Several rotations have been under test in field crops and cost per acre of different rotations determined. Cultural and rates of seeding experiments were continued, also data gathered on dates of seeding and ability of different crops to withstand frost.

The yields in cereals were unusually low owing to drought. In the uniform test plots of wheat Marquis and Red Bobs gave the heaviest yields, while Marquis weighed ½ pound per bushel more than Red Bobs. Banner oats proved superior to Victory in ability to withstand adverse conditions. Barley was poor and peas a failure. Flax plots were destroyed by a windstorm in June. Experiments with fall rye have been conducted.

All classes of forage crops were low in yield, though Western Rye grass and sweet clover proved best able to withstand adverse conditions.

The importance of growing the hardiest varieties of bush fruits has been demonstrated as in previous years. Vegetables were very much set back by drought and later frost, and for the first time in the history of this station potatoes were produced at a loss.

EXPERIMENTAL STATION, LETHBRIDGE, ALTA.

Work on the land commenced April 3, and seeding on the 7th. Rainfall during the growing season was very light (2·31 inches from April 1 to July 31) so that yields on non-irrigated land were very light. On land summer-fallowed in 1917 no grain at all was produced.

As usual, most of the field experimental work was conducted in duplicate on the irrigated and non-irrigated parts of the station. On the former, the yields were very light. Under irrigation, the highest yield of wheat was Marquis, 61 bushels 38 pounds per acre; Danish island oats gave 107 bushels; Bark's barley the same per acre. Mackay peas yielded 66 bushels per acre. In corn for ensilage, irrigated Yellow Dent

gave over 16¼ tons per acre. Several of the early varieties ripened seed. Roots were a good crop as was alfalfa under irrigation. On dry land the latter and the grasses were practically a failure. Nine hundred pounds of mangel seed was grown and 16 acres of stecklings harvested. Feeding tests with steers were carried on during the winter of 1917-18, showing a profit of $20.12 per head for the first lot sold and of $41.76 per head for a lot of 18 fed six weeks longer. A test started last winter is not yet completed.

The flock of sheep consists of 41 ewes, 35 shearling ewes, 27 ewe lambs and one Shropshire ram. The ewes are grade Shropshires bred up from a Merino base. During the year 7 pure-bred Lincolns and 5 pure-bred Rambouillets were bought for breeding work.

Feeding tests with lambs were carried on. One lot was sold early in the spring at a profit of $1.69 per head; the second lot was sheared early in April and sold about the middle of May, giving a profit of $5.27 per head. Homegrown lambs gave a greater profit than range lambs.

With swine, the Berkshire is the breed kept. Some experimental feeding was done during the year and an experiment in "hogging-off peas" was conducted, giving a return of $35 per acre for the crop.

The year with poultry was a successful one, and the demand for stock and eggs was greater than the supply.

Fruit crops were light. A large number of trees were winter-killed and frosts destroyed the crop on others. A good crop of the hardy vegetables was gathered.

EXPERIMENTAL STATION, LACOMBE, ALTA.

The land was in excellent condition, with a good supply of moisture when seeding commenced on April 13. May and early June was dry and windy with some damage from frost, and a severe frost in July injured crops severely in central and northern Alberta. Harvesting was carried on under favourable conditions and considerable fall ploughing was done.

There were 26 head of horses on the station and some experimental work was carried on as to cheap methods of wintering.

The dairy herd was composed of 29 head pure-bred Holsteins and 21 grade Holsteins. The average record of milk production was 7,539·1 pounds and the average return per cow for her product made into cheese was 188·25.

With sheep, over 400 ewes were used in the first year of the grading-up experiment, using rams of Shropshire, Oxford, Leicester, Cheviot, Hampshire and Corridale breeding.

Feeding tests with swine were continued, including pasture experiments and trials of self feeders. The year with poultry and bees was a successful one.

In field husbandry the work with rotations and cultural experiments was continued.

Tests of varieties of cereals, grasses and clovers and vegetables were carried on, but owing to scarcity of labour and seed the tests of varieties of corn and roots were discontinued for the year. Some varieties of apple trees fruited, and small fruits gave very good crops.

EXPERIMENTAL STATION, SUMMERLAND, B.C.

The season of 1918 was the driest recorded in the Summerland district. There was a shortage of water for irrigation and crops grown under dry-farming conditions were only saved in some districts by rain in August.

In field husbandry some interesting data were gathered as to the relation between amount of water supplied and yield, also as to the advantage of sowing without a nurse crop. In the test of cereals good yields were obtained on the irrigated plots, but those on dry land were a failure. An important feature of the work with forage plants was the growing of carrot and mangel seed. Two tons of carrot seed and over 7,200 pounds of mangel seed were produced and 20 acres of stecklings grown.

The fruit in the orchards under various treatments continue to make good growth. The tests of vegetables were reduced this year in order to leave more land for root-seed production.

The herd of beef cattle numbered 53. A feeding experiment was carried on during the winter, but owing to the high cost of feed, the margin of profit was small.

The herd of swine now numbers 25. Some experiments in feeding and housing were conducted with poultry and bees; the year was a fairly successful one.

Some additional plumbing was put in several poultry houses and hog cabins were built, and also a permanent root cellar. The office building and poultry administration building were painted and considerable wood-work done. Exhibits were made at a number of provincial fairs.

EXPERIMENTAL STATION, INVERMERE, B.C.

Seeding was completed by the first week in May, under favourable conditions, with abundant moisture in the soil, but prolonged drought following severely injured and in some cases destroyed, crops not under irrigation. Where water was applied some exceptionallly heavy crops were grown. Rain during drought brought on a good second growth and improved pasture conditions.

A commencement was made towards establishing a herd of Shorthorns and of Berkshire swine. Some interesting results were obtained in the laying record work with poultry and in the cost of feeding. The average yield of honey was 118.9 per colony.

An exhibit was shown at a number of fall fairs.

EXPERIMENTAL FARMS, AGASSIZ, B.C.

While the total precipitation for the growing season of 1918 was above the average the rainfall was badly distributed, resulting in injury from drought and dissolved and sprouted grain at harvest time. All crops gave decreased yields. Potatoes suffered from blight and rot.

There are ten work-horses and one driver on the farm, and feed costs were found to increase greatly during the year, amounting to 10·4 cents per work-hour for the heavy draft horses and 9·77 cents for the light draft.

The herd of dairy cattle numbers 80 head, made up of 39 pure-bred and 41 grade Holsteins. The quality of the herd is steadily improving. The average milk yield for the 29 cows, finishing a lactation period, was 9,042·19 pounds. The experimental feeding work was continued. Much of the milk was made into cream, Camembert, and Stilton cheese, and sold in Vancouver at a good profit.

The Dorset Horned and Oxford Down breeds of sheep are kept. The wool clip totalled 518 pounds from 67 sheep, and brought 61 cents per pound net. The sheep grading experiment was continued with good results.

With swine, the experimental work included comparisons of the self-feeder with trough feeding, barrow versus sow pigs for pork production, harvesting peas with swine, comparisons of barley with grade A screenings, and feeding varying quantities of skim milk.

Good progress was made in the work with poultry, including the breeding of heavy-laying strains and experimental feeding and housing, fertility studies, etc.

In forage crops special attention was paid to root seed growing. A ton of mangel seed was produced and 24 acres of stecklings grown. This work necessitated the reduction of the variety tests.

In the orchards, the trees are recovering from the ice injury of 1917. The season for small fruits was a good one.

Some repair work was done on the farm buildings and three acres stumped and cleaned last year were levelled, ploughed and sown to peas and oats. Three acres were brushed and stumped.

EXPERIMENTAL STATION, SIDNEY, B.C.

Insufficient moisture from April to September was the great drawback in the season of 1918. Seeding was completed three weeks earlier than the preceding year.

The regular work in breeding, experimental feeding and record keeping was carried on with the dairy, cattle, swine and poultry. The bees gathered a surplus of 50 pounds per hive.

In field husbandry four rotations are being carried on. Yields of fall wheat show from 21¼ to 24 bushels per acre. Spring wheat yielded very low owing to drought. Fall-sown oats also did best, although 50 per cent winter-killed. Good crops of root seed were obtained but the stecklings suffered from drought.

The orchards made good growth and gave heavy crops of fruit and nuts. Good results were obtained in vegetable-seed production and in the growing of medical plants, bulbs, etc.

A small building for horticultural work and a silo were put up, fields cleaned of stones and roots, roads and fences improved during the year. An exhibition was shown at a number of fairs throughout the province.

SUBSTATIONS.

Experimental work with cereals, forage crops, vegetables and fruits was carried on at Beaverlodge, Grande Prairie district, Fort Vermilion, Peace River district and at Grouard, all in northern Alberta; at Fort Smith, Fort Resolution and Fort Provi-

dence, in the southwest territories; at Salmon Arm, B.C., and at Swede Creek, near Dawson, in the Yukon. The work at Beaverlodge and Fort Vermilion is of a much wider scope than has been possible at the other points, and some very interesting and valuable data as to the agricultural possibilities of those districts have been obtained. The work at Swede Creek was started last year and so far has been mainly preparatory.

DIVISION OF CHEMISTRY.

The various phases of the division's activities have been carried forward during the past year with more than a fair measure of success, considering the serious difficulties—the absence of several members of the staff on active military service and the heavy influx of special work arising out of war conditions—under which the division has laboured.

For the fourth year in succession, a special effort has been made to encourage and assist the individual farmer towards a greater and more economical production of foodstuffs. The means by which this has been chiefly accomplished are by furnishing information and advice by correspondence, the examination of samples of soils, cattle feeds, etc., by analytical work wherever necessary and by bulletins, circulars, press articles, etc., specially written to meet the need and occasion. From the attitude of the farming community toward this campaign of education and the practical results in increased yields which have been obtained throughout the Dominion it is felt that these efforts have been successful. The influence of this work, we may be sure, is not merely transitory; Canadian agriculture, from the standpoint of efficiency and economy, must have received permanent value from this and similar movements.

The number of samples received for analysis during the past fiscal year was 9,568—a very large increase over that of any previous year. About 4,000 of these samples were flour and there were approximately 1,500 of condensed milk—both important matters of special interest, as connected with the export of food commodities for military and civilian use overseas and arising out of war conditions.

Owing to the pressure of work requiring immediate attention there has been, of necessity, a reduction in the time usually devoted to investigation and research. With the establishment of peace and the conclusion of special war work, these vitally important branches will again be prosecuted.

Further work has been accomplished in connection with the classification of certain lands in southern Alberta with irrigable and non-irrigable areas. This investigation, undertaken and conducted for the Reclamation Service, Department of the Interior, comprises the determination of the alkali content (if "alkali" is present) and of the physical condition of the soils and subsoils in question, and also, at present, the study of a number of closely allied features, e.g. the alkali content of soils as related to plant growth, the influence of irrigation on the vertical distribution of "alkali" etc.

Some progress has been made in the agricultural-meteorological study, in which the division has the assistance and co-operation of the Meteorological Service, but on the other hand there is a large amount of analytical work in connection therewith awaiting attention. Speaking broadly, the investigation has for its object the study

of the influence of climatic and seasonal conditions on the yield and composition of crops. As the work progresses, information of a most valuable character to many phases of Canadian agrieulture will undoubtedly be obtained.

The sugar-beet investigation has been continued. Beets of well recognized factory varieties, from imported and Canadian grown seed, have been grown on eighteen of the farms and stations of the system. The analytical results furnish confirmatory evidence as to the high quality of the beets grown from the Canadian seed and show that roots rich in sugar and of high purity can be grown in many parts of the Dominion.

The feeding value of the more important varieties of the field roots—mangles, turnips and carrots—as grown on the Central Farm, has been analytically determined. The results will be of interest to all stockmen using this important constituent in their rations.

The investigational work with fertilizers again yielded valuable data and indicated courses of future profitable study, particularly in respect to new and unusual sources of nitrogen, phosphoric acid and potash, which have been tested with a view to determining their fertilizing influence as compared with those of the more commonly used materials.

At five farms and stations of experimental farms system a new and comprehensive scheme (including 60 treated plots) was adopted with the object, primarily, of discovering the most profitable combination and quality of a fertilizer mixture, as measured by its influence, in relation to cost, throughout a three-year crop rotation. The plan provides also for the comparison of fertilizer mixtures with and without potash, of fertilizers used with and without manure, and of organic sources of plant food with those of mineral origin, etc.

The results from the crop of the first year, while not to be taken as conclusive, show —as might be expected at this stage—the superiority of the more readily available forms of the fertilizing elements supplied; they furnish also further proof of the superiority of manure and fertilizers as compared with results from the use of either alone.

The work in connection with the determination of the fertilizing value of rain and snow has shown that the precipitation at Ottawa has contributed 5·845 pounds per acre of nitrogen in readily assimilable forms during the past year. From 80 to 85 per cent of this nitrogen is furnished by the rain. At a conservative estimate the rain and snow supply, per acre, annually, plant food worth from $1.25 to $1.50.

About two hundred farmers submitted samples of their well waters for examination during the year. The results showed that only 33 per cent might be classified as pure and wholesome. The division again emphasizes the danger of polluted water to man and beast.

A large series of hay and pasture grasses is in course of analysis. The results will indicate the feeding value of the varieties under examination at several stages of growth, thus furnishing information as to the relative nutritive properties of the grasses and the best time at which to cut them for hay. This work has been undertaken for the division of Forage Plants, in connection with the breeding and selection experiments with grasses carried on by that division.

An important phase of the work of the division has been the analysis of samples of mill and other feeds sent in by farmers for examination for a report as to nutritive value. The larger number of these feeds have been oat products from oatmeal and breakfast food mills, and many of them, we regret to say, have been found to consist essentially or largely of oat hulls and of exceedingly poor quality.

To obtain a more complete and satisfactory knowledge of the various feeds on the Canadian market than would be obtained from the samples ordinarily sent in by farmers, a series comprising more than 400 samples has been collected at a number of points throughout the Dominion. These are now in course of analysis.

Among the fertilizing materials examined, limestones constitute the larger number. These have been sent in chiefly by provincial Departments of Agriculture, with a view to employing the deposits, when of good quality, in the manufacture of ground limestone —a soil amendment which is yearly receiving an extended use in Eastern Canada.

More than 4,000 samples of flour have been examined and reported on in connection with the official flour contracts in Canada. This work, in the first instance, was undertaken for the British War Office and has more recently been continued for the Wheat Export Company, the "Official agents of the Allied Governments," who have the purchasing of all flour supplies for military and civilian use overseas. This analytical control has not only been the means of effecting for the Empire and Allies, a saving of many thousands of dollars in the purchasing of the flour but also in keeping down the moisture content, has ensured the flour against spoiling during transportation and storage—a matter of no small importance.

The work for the Meat Inspection Division (Health of Animals Branch) has included the examination of 2,691 samples, of which 1,514 were condensed milks. The remainder comprised lards, tallows, oils, butters, oleomargarine, preserved meats, colours and dyes stuffs, preservatives, spices and condiments, evaporated fruit and vegetables.

A considerable amount of investigatory and analytical work of an important character has been undertaken for other branches of the Department of Agriculture and also for the several departments of the Government service. Among the latter may be mentioned the Post Office Department, the Department of Naval Service, the Department of the Interior, and the War Purchasing Board. The scope of these investigations shows that the Division of Chemistry of the Experimental Farms in addition to its purely agricultural work is materially assisting in many matters of general interest and importance.

DIVISION OF FIELD HUSBANDRY.

The Field Husbandry Division during the past fiscal year continued the investigations in soil management, crop management, and agricultural engineering. Both soil cultural and rotation investigations are under way on all the branch farms and stations in the Prairie Provinces and on the eastern and British Columbia farms and stations rotation work is established and cultural investigations are being introduced. At the present time this latter work is in operation on the Experimental Farm, Charlottetown,

P.E.I. At the Central Farm, Ottawa, the available land is fully occupied with rotations, thus enlargement on the work here is impossible unless more land is procured.

As in the past, the cost of production of crops has received considerable attention on the several farms and stations. Observations are made also on the influence which labour saving implements and different methods of cropping have in lowering costs.

FIELD CROPS AT THE CENTRAL FARM.

On the Central Farm, uniformly heavy yields were recorded in 1918. Cool, dry weather in April facilitated seeding operations, with the result that all grain was sown by the end of the month. Hoed crops, including potatoes, mangels and Indian corn, were planted by May 24 and at this date grain, meadows and pasture were growing rapidly. The month of June was cooler and wetter than usual and while grain and root crops did well, corn and hay made slow growth. Hay was cut early in July, averaging 2·25 tons per acre; a second cut later in the season made a total yield of 3·62 tons per acre. In August, oats were harvested averaging a profitable yield of 77·3 bushels per acre. September was exceptionally wet, and, while corn harvesting was tedious the crop was saved in good condition, averaging 18 tons green fodder per acre. Potatoes were dug early in October and averaged 275 bushels per acre. Continued wet weather in September and October nullified the efforts at after-harvest cultivation. Fall ploughing was hampered, but favoured by an open fall this work was practically completed.

DIVISION OF ANIMAL HUSBANDRY.

The live stock work on all experimental farms and stations has made marked progress in all branches during the year. In addition to the lines of work already established, many new lines of work have been undertaken. Again, every effort was made to assist in the movement for greater production of animals and animal products. The question of animal feeds was given attention, especially along the lines of testing by-products available but not generally appreciated as feeds. Other similar trials were conducted in methods of feedings and labour-saving devices in feeding. A large number of articles and circulars were published giving this information.

HORSES.

The horses on the Central Farm are mostly of the draught type, excepting the necessary drivers and express horses. With the exception of two tractors which are used experimentally, all power and transportation on this farm is furnished by horses. Amongst the draught horses are a number of excellently bred Clydesdale mares, which are used for general farm work and for breeding purposes. Very few foals were born during the year, but these did exceptionally well. No feeding experiments were conducted with the working horses during the year, but the accumulation of correct data as to the costs of rearing, cost of maintaining horses, and the like, continued on this farm and on the branch farms.

CATTLE.

Beef Cattle.—Breeding beef-cattle are not maintained on this farm, owing to the lack of sufficient housing and pastures. This is unfortunate, as the demand for information and assistance along these lines is rapidly increasing in this part of Canada. During the past year, however, considerable experimental work was conducted in the finishing of steers for market. Three lines of work were undertaken and conducted successfully. These are as follows:—

1. A comparison of rough, open-front sheds with warm barns for winter steer finishing. Although the steers housed in the barn made the greatest gains in proportion to feeds consumed, yet the interest on the building more than offset the difference in profits.

2. A comparison of light *v.* medium-grain feeding in winter finished steers. This trial showed again the value of comparatively light-grain finishing until very near the end of the finishing period. Although gains were not quite as great, yet profits were decidedly greater for the light-grain fed steers.

3. A comparison of breeds of steers in winter finishing. Although in this trial the Shorthorns stood first, Herefords second, and Angus third, as to profits, total gains and economy of gains, yet a careful study of the individual groups showed that there was more difference within the breeds themselves than between the breeds. Hence, several years' trials with large numbers of steers would be necessary in order to draw definite conclusions.

Dairy Cattle.—The herds of dairy cattle have progressed rapidly during the past year. Many excellent animals are now to be found in the four breeds—Ayrshire, French-Canadian, Holstein and Jersey—as well as a few choice grades of the Ayrshire and Holstein breeds. The health of the herd has been excellent throughout the year and the losses which were exceedingly light, were due largely to old age or accident. Again there is a material increase in the size of these herds, and the dairy barns are filled. The average milk production per cow has again largely increased, and in spite of high feed prices, profits also have been increased. Many splendid records have been made by individuals of all breeds. The increased demand for young breeding stock and the more rapid sale of young bulls are a healthy indication of the increasing popularity of the work done by this farm.

Several important lines of dairy-cattle feeding experiment were conducted during the year. Outstanding amongst these are:—

1. Completion of the comparisons of ensilage *v.* green feed as summer supplements.

2. The trial of new products, such as coffee bran and palm nut oil meal, with the hope of discovering cheaper substitutes for expensive feeds, of which there was a limited supply.

3. Several trials were made with new compounded dairy meals as compared with well balanced standard meal rations.

4. An increasing number of experiments with equipment, such as milking machines, was conducted.

5. A series of experiments was also inaugurated to discover the exact cost of rearing young dairy cattle.

Experiments along the lines of dairy manufacturing continue to hold a prominent place in the work of this Division, but the real investigational work is largely curtailed for the lack of a modern and commodius dairy. The gross receipts from dairy products sold again show a marked increase, this year the amount exceeded $12,500.

SHEEP.

The sheep on this farm continue to improve rapidly as to quality and profits. Owing to the very limited area for pasture greater expansion in the sheep work is impossible. However, careful figures are collected as to cost of rearing, profits from a small farm flock and a few trials in feeding, care and management are conducted. In spite of the decline in price of wool and the somewhat lower values of lamb and mutton than of a year ago, the profits in this department continue large.

SWINE.

Swine husbandry has expanded even more rapidly than other live stock, due to their requiring less land. Two large pure-bred herds are kept representing the two breeds—Yorkshire and Berkshire. From these herds large numbers of breeding animals are sold annually, as well as several cars of butcher hogs finished on various experiments. Excellent results from experiments were obtained. Some of the more important of these experiments were:—

1. Pastures for growing shoats, comparing clover, rape and barley pastures with dry lot feeding.
2. Pastures for dry sows.
3. Grain rations for weaning pigs.
4. Screenings (standard stock food) compared with other available grains.
5. Shelters for finishing hogs during summer and winter.
6. Self-feeders for winter and summer use.

ASSISTANCE TO BRANCH FARMS.

The Dominion Animal Husbandman, in addition to other duties, has visited the branch farms and stations and assisted the superintendents in establishing more and larger herds and flocks, in increasing production, establishing new lines of live stock investigation, planning new buildings, adopting labour saving machinery and similar extensions and improvements.

In addition to this regular work on branch farms, this division also has control of the cattalo breeding work being conducted by the Experimental farms at the Buffalo Park, Wainwright, Alberta. Little progress has been made during the year, but prospects are brighter for the future.

MISCELLANEOUS.

This division has continued preparing and distributing free plans of farm buildings.

Correspondence has again increased enormously over preceding years and every attention is given to this direct means of assisting farmers.

In addition to the above enumerated and other regular work, the staff of this division has been called upon to address a large number of meetings, prepare special material for publication by other branches and departments and to judge live stock at a large number of agricultural fairs.

HORTICULTURAL DIVISION.

While the horticultural work on the Experimental Farms and Stations has been hampered to a considerable extent during the war because of lack of skilled help, a large proportion of the gardeners having left to go overseas, and while in 1918 this condition reached a very acute stage, yet considerable work was done.

It has been the aim to establish horticultural plantations on all the farms and stations, and for the prairies and other parts of Canada where settlements are comparatively new, the importance of obtaining new and hardy plants has received much consideration. Canadians in the past have had to depend on other countries for new varieties of fruits and vegetables, but the Experimental Farms Branch has for some years been breeding new varieties with the object of obtaining such as would be suitable for the climatic conditions met with in different parts of Canada. The wild Siberian crab was used as the basis for one line of apple-breeding work for the colder parts of Canada, and certain varieties, such as Osman and Columbia, though crab apples, are a marked advance over the wild crab and are doing well in the Prairie Provinces. Many crosses between these hardy improved crab apples and the apple were made, and trees resulting from them have fruited, and the best of these, which are much larger than the first crosses, have been propagated, and are being tested for relative hardiness. A large collection of hardy fruits has been brought together at the Experimental Station, Morden, Man., and many trees were added to the orchard there in 1918. Collections of fruits were also sent to the newer Experimental stations at Beaverlodge, Alta.; Kapuskasing, Ont., and Spirit Lake, Que., and it will soon be known which of the cultivated varieties will succeed best at these stations.

Collections of vegetables and flower seeds have also been sent to these newer stations, and valuable information is being accumulated for the use of settlers who will be saved much expense and disappointment by learning from the station nearest to them what will and what will not succeed. Vegetable seeds were again sent to the far northern substations in 1918. From these tests, year after year, valuable data in regard to the climate and the possibilities of growing different kinds of horticultural plants are being obtained.

The Dominion Horticulturist visited the principal farms and stations, as usual, in 1918 to confer with the superintendents in regard to the work.

INJURY DONE BY THE SEVERE WINTER OF 1917-18.

The winter of 1917-18 will long be remembered by fruit growers in the provinces of Ontario and Quebec, for not for many years has there been such loss from winter-killing. Very low temperatures in early winter coming after a short season of growth when the wood was not as fully ripened as usual, is thought to have been the main cause of so many trees being killed, although the long-continued cold weather was, no doubt, responsible for much of it. In the Province of Quebec a very large proportion of the Fameuse trees were killed, it being estimated that from 50 to 75 per cent died. The losses were very heavy in the large apple orchards along lake Ontario and, in the tender fruit districts, while relatively few trees were killed, the peach trees were in many cases severely injured. In the orchards at the Experimental Farm, Ottawa, the losses were heavy among apple trees and European plums and, while but few pears and cherries had been growing there, they were badly affected. This severe winter, however, again clearly brought out the fact that hardier varieties are needed for Canadian orchards. Many hardy good varieties of apples originated in the Horticultural Division withstood this cold winter, and it is expected that some of them will eventually take the place of more tender sorts now on the market.

VEGETABLE SEED CROPS.

While vegetable seed was not grown on a large scale, as was the case with field roots in the division of Forage Crops, experiments were continued at the central and branch farms in the Horticultural Division in the growing of seed of the different kinds of vegetables with a view to learning more about methods of growing and yields and quality of home-grown seed and in order to obtain foundation stock for increase should the war continue and the shortage of vegetable seeds become acute, necessitating the growing of seed in Canada to meet the requirements. Very good seed crops were obtained of beets, carrots, parsnips, spinach, lettuce, radish and other annual and biennial vegetables, and much was learned in regard to methods of culture and storage. From experiments which have been made in the comparison of the crops raised from home-grown and imported seed, the crops from home-grown seed have compared very favourably with the imported.

VEGETABLE CULTURE AND BREEDING.

While cultural experiments with vegetables were not so numerous as in some previous years, more attention having been paid to seed crops, some interesting results were obtained. The importance of planting potatoes not later than the middle of May for largest yields in the older settled parts of the province of Ontario or where the summers are warmest was again confirmed, and just as marked differences were obtained from seed of the same variety of potatoes but from different sources as in other years. Crops of cucumbers, tomatoes, melons and head lettuce were among those grown in the greenhouses. Certain varieties of head lettuce, such as Early Paris and Sutton Golden Ball, have been found to be much more suitable for growing in greenhouses in winter at Ottawa and can be planted more closely together than the Boston Market, which is the favourite variety where winters are milder.

Work in the breeding of vegetables was continued in 1918. A special endeavour is being made to originate early varieties of corn, peas, beans, tomatoes, onions, etc., that are earlier, more productive, and better in quality than those available at present. Among the newer crosses which have been made are some very promising varieties of peas.

EXPERIMENTS AND DEMONSTRATIONS IN CANNING FRUITS AND VEGETABLES.

The work begun last year in experimenting with different methods of canning fruits and vegetables, and in demonstrating the best methods to the public was continued in 1918, as the interest in the canning of vegetables was great, and the demonstrations proved very popular, many persons going to see them. A large number of inquiries were received by letter. The work was in charge of a graduate in domestic science from MacDonald College, Que. The information obtained from the two years' experiments has been put in bulletin form, and will be published during the coming year.

ORNAMENTAL PLANTS.

While the more practical, or economic, side of the horticultural work, received the greatest attention during the war, the ornamental was not neglected, as there is great need for improvement in the grounds about many Canadian homes, and it has been the aim to obtain information that would prove useful to those who desired to beautify their home surroundings, by experimenting with many kinds of plants at the experimental farms and stations in different parts of Canada. The ornamental grounds at these places were visited by very many persons during the year, who must have received much inspiration to beautify their homes. The professional florist has also been considered, and experiments were continued with greenhouse flowers, especial attention being paid to the chrysanthemum, schizanthus, cineraria, cyclamen and geranium, some very fine varieties of the last having been originated at the Experimental Farm, Ottawa.

CEREAL DIVISION.

THE SEASON.

Broadly speaking, the season of 1918 was unfavourable for cereals in Canada, because of the drought and frost which occurred over some of the largest cereal-producing areas. Farming conditions were, however, very good in many sections of the country, particularly in Ontario, and the provinces farther east; although an excess of rain in the late summer and early autumn caused difficulties and damage in some districts, especially in the province of Quebec. On account of continued high prices for all kinds of farm produce, the season was a successful one almost everywhere, except in those unfortunate localities where the lack of rain was acutely felt, and where in consequence, the crops were almost a total failure.

TESTS OF VARIETIES.

The usual variety tests were conducted on the Central Experimental Farm at Ottawa, and on the various branch experimental farms and stations. At a few places the tests did not give much information of value, on account of the unusual weather conditions, but at the majority of the farms, interesting observations were made in regard to the characteristics of the varieties and their suitability for the various climatic conditions of our country.

NEW VARIETIES.

From time to time the Dominion Cerealist introduces new varieties of grain, derived from the large series of crosses which he has carried out during the last decade or two.

Ruby wheat, which was introduced last season, did very well in all the localities where it was expected to succeed, except where drought and frost were very severe. It proved, however, reasonably resistant to these unfavourable conditions. A considerable quantity of Ruby wheat has been distributed free during the past winter, to farmers who wished to test this promising new variety.

The new hulless oat Liberty, which was announced a year ago, has been distributed to a number of farmers in various parts of the country, and interesting results are expected this season from these free samples. Only a very few could be sent out a year ago, but some of those gave extremely good results. This new oat is beginning to be much sought after on account of its special adaptability to the production of a high grade of feed with the minimum of trouble and expense.

The new variety of barley, Albert, Ottawa 54, which was introduced a short time ago, has proved very productive, considering its extreme earliness. While it will never be a popular sort for ordinary uses, it is certainly worthy of consideration wherever the greatest earliness is required. It may also be of special value in helping to solve the wild oat problem in the central provinces.

FREE DISTRIBUTION OF SEED GRAIN.

The annual seed distribution was carried on as usual, but a larger number of samples than in the previous year were distributed. Although some of the seed sent out was not as large and plump as might have been desired, on account of the dry conditions where the grain was grown, nevertheless it was all of very high quality and purity, and was appreciated by the farmers who received it. The grain for distribution was grown chiefly at the following farms: Indian Head and Rosthern, Sask., Brandon, Man., Cap Rouge and Ste. Anne de la Pocatière, Que., and the Central Farm at Ottawa.

MILLING AND BAKING TESTS.

The investigations under this head were conducted as usual, a large number of new cross-bred wheats being studied, so as to eliminate any which were deficient in baking quality. A new series of studies on the affect of age on wheat and flour was

started and tests begun some years ago were continued. It has been found that both wheat and flour remain in good condition for a surprisingly long time under proper conditions of storage. Excellent bread was made from flour twelve years old. Considerable time was devoted to a study of bread produced by mixing various flours with ordinary wheat flour.

DIVISION OF BOTANY.

The investigations into the distribution of white pine blister rust were continued during the past year, and were extended into the prairie provinces with a view to observing whether the rust would be found on currants—principally black currants which are the most commonly affected—that originated in an area known to be generally affected by the currant stage of this rust. It is held by some investigators that the commercial distribution of currants may serve as a means for spreading the disease into areas as yet not invaded. Fortunately the inspectors were unable to find any evidence in practical support of this point of view.

The disease is still confined to southern Ontario and Quebec.

A number of experimental blister rust control areas were established during the year; it is the intention to observe in these areas the effects of practical control measures on a larger scale. The damage to pines, even in areas reported to be severely affected, has so far been very slight. Indeed it would seem that the investigations conducted by the officers of the department reveal a far more hopeful future for the pines than seemed reasonable to expect at the outset.

Some few years ago, the division commenced determined efforts to increase the yield of potatoes, as it had been found that certain diseases conveyed principally by unsound tubers—though these themselves showing no external signs of disease—were generally responsible for the low average yields in certain localities. Good results have been obtained from a change of seed, and the necessity of providing prolific strains free from the constitutional troubles, led to systematic inspection of growing crops of harvested tubers, those qualifying being certified as first-grade. These seeds are very readily bought wherever it is found necessary to change the seed supply. The aim of this work is to effect a general improvement of the potato industry of Canada, and not merely to encourage the production of first-rate seed by a limited number of growers. This aim should not be lost sight of.

The free distribution of pure cultures of nitro bacteria, is increasingly made use of by farmers all over the Dominion. The benefits frequently emphasized in the crops treated with these cultures are earlier maturity, better stands, larger yields, and, in the case of alfalfa, increased resistance to winter killing.

In the field laboratories of the division, useful progress has been made, partly by demonstrating successful control methods of destructive diseases such as late blight in potatoes, and partly by the investigation into the cause and control of plant diseases in general.

Thus the Charlottetown laboratory principally looks after potato disease investigations, while the Fredericton laboratory devotes its energies to the control of diseases

affecting vegetable and root crops, and the St. Catharines laboratory to the diseases of fruits. However, the main purpose of all these laboratories is to act in an advisory capacity on matters pertaining to the general plant pathological problem of their respective localities.

Investigations with a view to discovering some means or measures by which the severe annual losses from grain rust may be reduced, have been going on for two years. Generally speaking careful farming, the avoidance of cultural errors, together with other essential primary factors well observed, must be regarded as the most practical means at present to meet a rust epidemic. It seems largely a question of anticipating losses, by preparing at the outset to meet them. Good and systematic progress is being made in this work. A spirit of co-operation with the grain-producing States of the Union to the south, promises concerted action relating to the eradication of certain barberry species, which act as host plants to grain rust. Efforts are being made in the Dominion to have all these barberry bushes removed.

Reference to investigations of a more technical character going on in each of the laboratories of the division, is being omitted since they cannot well be reported on until concluded.

In general and systematic botany the regular lines of work were carried on, including identification of plants, giving information on medicinal and poisonous plants, adding to the collections in the Herbarium and Arboretum, etc. Climatic tests were carried out with a number of plants of economic value.

DIVISION OF FORAGE PLANTS.

FIELD ROOT VARIETIES.

Numerous observations have been made, especially during the last few years, to the effect that a large number of the varieties of field roots, including mangels, swede turnips, and carrots, which are offered for sale in Canada, are far below the standard in respect to uniformity and trueness to type. In many cases, especially in mangels, the seed sold under a certain name produces crops in which it is even difficult to find roots belonging to the type which the name indicates.

Realizing that there was room for improvement work with field-root varieties in Canada, the division undertook some years ago to improve a few of the best known types of field root by means of a simple method of mass-selection whereby, without much labour and expense, superior strains could be developed from the old standard varieties. This method, which is a combination of selection for purity of type and selection for increased average dry-matter content, has given so promising results that, this year, the division has recommended its introduction on all farms and stations in Eastern Canada and British Columbia. A plan has been worked out whereby it will be possible, by adoption of the method of mass-selection referred to, to develop strains of all the different types of mangels, swede turnips, and carrots, improved to such a degree that seed produced of the same may to advantage be used as so-called "stock seed" by any one who, in the future, may interest himself in the production of field root seed as a commercial undertaking.

FIELD ROOT SEED PRODUCTION.

Experiments.—Experiments at the Central Experimental Farm for the purpose of ascertaining what principal factors influence the yields of root-seed crops have so far been confined to mangels, for the reason that, of the field roots, mangels have so far never failed to produce excellent seed at Ottawa. This year, although the weather conditions during harvesting time were extremely unfavourable, seed of an exceedingly high quality was obtained. As a matter of fact, the mangel seed produced at Ottawa this year is far superior in respect to vitality to any mangel seed raised on any other Dominion Experimental Station.

The experiments in mangel seed raising conducted in previous years have demonstrated that early planting of the seed roots and a good state of fertility of the soil are factors upon which a heavy seed yield depends. This year a somewhat elaborate experiment, comprising 96 different plots, was conducted for the purpose of ascertaining what influence some other factors have on the seed yields. The results obtained corroborate the results obtained in previous experiments, viz: that a heavy application of manure together with a liberal amount of chemical fertilizers increase the seed yields very considerably. They also show that far heavier seed yields per acre are obtained when the seed roots are planted comparatively closely together than when they are spaced farther apart. Thus, anywhere from 25 to 50 per cent heavier crops may be obtained with the seed-roots planted 3 by 1½ feet than when they are planted 3 by 3 feet apart.

Emergency Root Seed Production.—On recommendation of the Seed Commissioner, the department requested, in 1917, the Division of Forage plants to arrange for the production of field root-seed on a commercial basis this year, the said seed to be made available to the market in case a shortage in the seed supply should develop. Under the direction of the Dominion Agrostologist considerable quantities of root-seed were produced and the following quantities made available to the market for the 1919 seeding:—

	Pounds.
Mangel seed	24,300
Swede turnip seed	36,700
Field carrot seed	4,200

Of these quantities the various experimental farms and stations contributed as follows:—

	Pounds.
Ottawa	17,200
Kentville, N.S.	26,500
Nappan, N.S.	7,000
Fredericton, N.B.	800
Ste. Anne de la Pocatière	900
Lethbridge, Alta.	1,000
Summerland, B.C.	10,000
Agassiz, B.C.	1,500
Sidney, B.C.	300

In case it should be found necessary to produce similar or large amounts of field root-seed in 1919, the division has arranged to have the necessary stecklings available in the spring of 1919 for planting to seed at the above-mentioned stations.

BREEDING WORK.

Owing to the large amount of extra work which the division was called upon to do in connection with emergency root-seed production, it was found impossible to pursue the breeding work with grasses and clovers in all its details. However, some lines of the breeding which required a comparatively small amount of work were followed up, the most interesting ones being the breeding work with Red clover and the work with Western Rye grass.

Breeding work with Red clover.—The breeding work with Red clover, which was started in 1913, has now advanced so far that practical results are being obtained. The division started the red-clover breeding with the object of developing in the first place, a perfectly winter-hardy strain of, if possible, greater longevity than the ordinary biennial red clover. When this object had been reached, the division, it was planned, would proceed with the development of particularly high-yielding varieties from within the winter-hardy strain.

The first object of the breeding work, i.e. the development of a winter-hardy strain of a perennial character, is now accomplished. The strain in question was sown in test plots in 1916. In 1917 one hay crop and one seed crop were harvested and in 1918 two crops were taken from the very same plants which yielded one hay crop and one seed crop in 1917. This red-clover strain, consequently, is capable of yielding full crops for at least two consecutive years. Indeed, judging from the stand early in the spring of 1919, it will even last through three consecutive years and may, therefore, be considered a true perennial. This perennial red clover will furnish the material for red-clover breeding for increased yield.

Western Rye grass.—Experiments conducted with Western Rye grass during the last few years have revealed that this grass, unlike all other cultivated grasses, breeds normally true to type, the reason for this being that the individual plants are regularly self-fertilized. In this respect the Western Rye grass behaves just like wheat and, this being the case, it will be a simple matter to develop hundreds of distinct and constant varieties of the Western Rye grass in a comparatively short time. The division secured, this year, about one-hundred living plants of Western Rye grass, representing as many different wild forms. These will, it is intended, serve as starting material for quite extensive breeding work which will be proceeded with the coming year.

BEE DIVISION.

Beekeeping was stimulated during the year by the continued rise in the price of honey after a winter which set in severe early and consequently caused considerable loss of bees to those who were unprepared.

Bees were kept at sixteen of the experimental farms during the year. At the Central Farm, Ottawa, 6,485 pounds of honey were taken from 33 colonies, spring count, a return of 196 pounds per colony, making the average for the past six years 121 pounds per colony.

During the season of 1918 the study of the two principal problems of beekeeping in Canada, reduction of winter loss of bees, and the control of swarming, was continued

at the Central Farm. As a contribution to the solution of these problems, and in order to make better use of the excellent opportunity for raising bees in the spring prior to the surplus honey flow that the climate of most parts of Canada presents, a system of management involving the keeping of two queens in the hive for eleven months was devised by the Apiarist and carried out experimentally on a small scale with encouraging results.

Progress was made in an attempt to breed a non-swarming variety of bee. A number of queens were bred at the Central Farm from the only colony out of thirty-one in the apiary that made no preparations for swarming. Some of these queens were taken by the Apiarist in nuclei with drones of selected perentage to Kapuskasing, Ont., and Lake Edward, Que., to be mated, there being no probability that other drones were present in the neighbourhood of these places. Several matings were obtained, and much information which it is expected will facilitate bee-breeding work in the future was secured.

Beekeeping conditions in the northern part of Canada were studied concurrently with the mating experiments. The need for better protection of the hives in summer, better insulation and drainage of bee cellars, and the presence of certain conditions favourable for the black race of bees were noted.

The usual comparison between wintering bees outside and in the cellar was made at the Central Farm, and the advantages of wintering outside in cases containing four colonies each, in a place sheltered from wind, were again demonstrated. It was found that a thickness of five to six inches of packing consisting of planer shavings between the hives and the sides of the case gave no better results than a thickness of two and a half to three inches of the same material.

Different kinds of winter stores for bees were tested at Ottawa in 1918-19, and special attention was paid to substitutes for the syrup made from refined sugar on account of the serious shortage of this due to the war. Syrup made from raw sugar was found inferior to that from refined sugar, and cane syrup (golden syrup) killed in three months the only colony to which this was supplied. Dandelion honey was found to be unwholesome, but the white honey gathered in July, 1918, was found wholesome. The best results, however, were, as usual, obtained from the regular stores supplemented with a liberal amount of syrup made from refined sugar.

POULTRY DIVISION.

In the Poultry Division, work of all kinds pertaining to the production of poultry is conducted. This includes experiments and investigations and a limited amount of demonstration in the form of exhibits at fairs, etc. The investigations besides poultry, include work with wild fowl, pigeons and rabbits.

This year the division has carried on at fifteen branch farms and stations besides the central plant at Ottawa. One new plant was started at Summerland, in the Okanagan valley, B.C., and buildings were commenced at Lennoxville, P.Q., but could not be finished in time for stock before winter.

During the winter 1918-19 a special poultry exhibit was sent to a circuit of winter shows throughout western Ontario. This proved a very attractive as well as instructive exhibit.

The work of the year, as a whole, has been the most satisfactory of any year since the division was inaugurated. For the past three or four years the work has been more or less hampered, because of the fact that many of our best men were enlisting. During this year, and especially the latter part of the year, the men have been returning and better men were available.

The pedigree breeding conducted at the central plant has been developing. This year practically every branch farm received a number of pedigreed cockerels for breeding purposes. Several of the branch farms, where suitable stock and efficient management are available, are now assisting in the pedigree work.

EGG LAYING CONTEST.

A new feature was introduced this year, being an egg-laying contest, staged at the Experimental Farm, Charlottetown, P.E.I. This contest was started November 1 last, to run for eleven months. There are twenty pens of eight birds each, seven of which are pens from the Island. The housing is in colony houses, 10 by 12, two pens to a house.

Egg laying contests have done much to encourage production, and the interest taken in this contest should emphasize the value of the hen that knows how to lay.

TOBACCO DIVISION.

The season of 1918 was a remarkable one in the history of tobacco-growing in Canada. Never before had our native tobaccos been in such active demand, and as a consequence the price paid for these reached a level which may never be attained again. The cause of this was doubtless the increase in duties on imported tobacco placed in the spring of 1918 and the lowering of the world's supply of tobacco. The most lasting result of the situation last year is that a number of Canadian manufacturers who previously had been somewhat unwilling to try our native tobaccos made up their minds to use them to a considerable extent.

In Quebec the season was unfavourable and good crops were the exception. The total yield did not exceed that of 1917, although the area planted to tobacco was considerably larger. On the other hand the high prices obtained for the crop made the year a very profitable one indeed to the tobacco grower.

While the tobacco crop in Quebec suffered from too much moisture and too low a temperature, in Ontario it was damaged by a long drought which on most plantations kept the tobacco plant from reaching full development. The Ontario production of tobacco was about eight million pounds of which one million was of yellow tobacco, air cured.

On the Experimental Station at Harrow, the results obtained in 1918 were very satisfactory, the quality of the yellow flue-cured tobacco was the best so far produced

there. While the leaves were somewhat shorter than usual the colour was clearer and the proportion of yellow tobacco much higher.

At the Farnham, Que., Tobacco Station, results were not so good. The district in which the station is located suffered very much from constant rain and cold weather. It was the middle of August before really warm weather was experienced and under these conditions a normal tobacco harvest was impossible. At the station at St. Jacques l'Achigan, Que., the tobacco leaves harvested were short but of good quality.

The results obtained on the tobacco plantation at the General Farm were particularly good. The selections made preserved their characteristics and even showed some improvement. Some of them may be considered now as practically fixed at least from the industrial point of view. Certain crosses recently made promise to be very interesting.

The study of tobacco soils in Canada progressed well as far as the tobacco districts of Ontario are concerned and a bulletin is now in preparation giving some of the results of this work. The work in the curing barn and tobacco warehouse was carried on successfully and the value of certain varieties grown in Canada and used as cigar binders was definitely established. Comparisons in different methods of fermentation of tobacco were also made.

The demand for seed of the White Burley tobacco was much greater than heretofore and it was evident that the tobacco growers of Ontario were planning to increase considerably the area planted to this tobacco. The demand in Quebec for tobacco seed of varieties suitable for pipe tobacco lessened considerably, owing no doubt to the increased prices being paid for cigar tobacco. This is doubtless only a temporary condition which will correct itself as soon as the price of cigar tobacco becomes normal.

DIVISION OF ILLUSTRATION STATIONS.

The work on the Illustration Station for the past four years is showing the value of continuous good cultivation, systematic rotation of crops and, particularly, the value of good seed.

During the past season, it was quite noticeable that crops grown on the Illustration Stations, and for several miles round, gave higher yields than those grown on farms more distant.

In most parts of Alberta and Saskatchewan, seeding began about April 15. There was a good supply of moisture in the surface soil and the seed germinated rapidly, making good growth for a short time. Continuous dry weather, accompanied by high winds checked the growth to such an extent that in some districts crops were almost a failure. In eastern and northern Saskatchewan and in northern Alberta few crops were harvested.

The following are the rotations being conducted on the Illustration Stations:—

SOUTHERN ALBERTA AND SASKATCHEWAN.

Two-year rotation.

Summer-fallow and wheat alternately.
Summer-fallow and oats alternately.

Three-year rotation.

Summer-fallow, wheat, wheat.
Summer-fallow, oats, oats.

Four-year rotation.

Summer-fallow, wheat seeded with Western Rye Grass, hay, hay.

NORTHERN ALBERTA AND SASKATCHEWAN.

Three year rotation.

Summer-fallow, wheat, wheat.
Summer-fallow, oats, oats.

Five year rotation.

Summer-fallaw, wheat, oats seeded with Western Rye grass, hay, hay.

Interest in corn-growing is increasing, particularly in southern Alberta. Wheat and corn are sown alternately, the object being to see if corn can be profitably grown and how much summer-fallow might thus be eliminated.

Fodder Crops.

Western Rye grass and alfalfa are grown on the Illustration Stations. It is found that when alfalfa is grown in rows and cultivated, better results are obtained than when it is sown broadcast.

Gardens.

While the chief object of the Illustration Stations is soil cultivation and crop rotation, other departments of the farm receive attention from the instructors.

A collection of garden seeds, which had been generated and tested at the Experimental Farm, was sent to each illustration Station. Instruction was given as to their growing and record sheets were provided each operator so that notes might be taken as to the suitability of the seed to the different sections of the Dominion.

Increased interest is being shown in this work, especially by the women and children, who, in many cases, take full charge of the gardens.

Poultry.

The poultry on the Illustration Stations is being improved. With but few exceptions most of the flocks are now pure bred. The surplus stock is sold to neighbouring farmers for breeding purposes.

Visits to the Illustration Stations.

The inspector in charge of the work in each province, visits the illustration fields at least once each month and a visit is made by the supervisor once each year.

The object of these visits is to instruct the operators, and to see that the work is carried out as directed.

Farms in the surrounding districts are also visited and advice and instruction is given in general farm work.

QUEBEC.

The object of the Illustration Stations is to grow such varieties of grain, clover, grasses, corn, roots, etc., as are suitable to the soil and climate in which the stations are located.

Rotation of crops is also one of the special features of the work.

The following rotation is now being carried on at most of the stations in the province:—

Hoed crops, including corn, roots, potatoes, etc.

Grain seeded with clovers and grasses.

Clover hay, usually two crops the same season, one for fodder, the other for seed.

Hay or pasture. When timothy is harvested, part of the field is saved for seed.

The following are some of the noticeable features of the work:—

In a four year rotation one quarter of the illustration fields are in cultivated crops, following a meadow. As soon as the hay crop is removed, the land is ploughed as shallow as possible and kept perfectly free from growth until autumn, when it is thoroughly ploughed and set up to the winter frosts. By this method the land is kept free from weeds and the soil put in good mechanical condition for grain to be seeded with clovers and timothy the following year.

When 10 pounds of timothy and 10 pounds of clover are sown on land prepared as above there is very little difficulty in securing a good crop of grain and there scarcely ever fails to be a good growth.

Illustration Stations are now in operation at the following points in Quebec.

Aubrey, Châteauguay County,
Lachute, Argenteuil County,
Paspebiac West, Bonaventure County,
Stanbridge East, Missisquoi County,
Drummondville, Drummond County,
Lac à la Tortue, Champlain County,
L'Assomption, L'Assomption County,
New Richmond, Bonaventure County,
Rimouski, Rimouski County,
St. Clet, Vaudreuil County,
St. Isidore, Dorchester County,
Ste. Julie, Verchères County.
St. Gédéon, Chicoutimi County.

DIVISION OF FIBRE PLANTS.

The work of the Economic Fibre Production Division during the year consisted chiefly of variety and fibre yield tests, tests of pulling machines, investigations of other flax machinery devices and water retting.

Variety tests with several strains of flax were conducted on the Central Farm and at several points throughout the Dominion. The yields were on the whole satisfactory. The Long Stem variety stood highest in order of merit. The flax produced in Ontario was valued more highly by United States spinners on account of its superior spinning qualities.

Pulling machines of several designs were tested out, one of which was found to do satisfactory work. In all probability several of these machines will be operating during the coming season.

Decorticating machines were investigated but none was found to have any commercial value.

A considerable quantity of flax straw was retted in the concrete tanks for commercial purposes, using water at different temperatures. It was found that water at 75 degrees F. gave the most rapid and satisfactory ret. The time required was five days. The fibre from the retting experiments were tested out in the heckling process for yield and spinning qualities, and gave excellent results.

DIVISION OF EXTENSION AND PUBLICITY.

Although in some provinces the number of fairs held was greatly reduced, owing to war conditions, in other parts of Canada the work of the division was expanded, so that the total number of exhibits made remained about normal. A feature of the year was the increased number of applications for exhibits at seed fairs, winter fairs, etc., which were complied with as far as possible. A specially large and complete exhibit was made at the Central Canada Exhibition held at Ottawa in September, and in March, 1919, the chief of the division left for France in charge of an exhibit for the Industrial Fairs at Lyons, France.

Through the medium of the fairs at which an experimental farm exhibit was made, a considerable amount of literature on farm topics was distributed to applicants, and several thousand names added to the mailing lists of the department.

HEALTH OF ANIMALS BRANCH.

The Veterinary Director General, who is in charge of the Health of Animals Branch, administers the Animal Contagious Diseases Act and the Meat and Canned Foods Act. The enforcement of these acts necessitates the employment of approximately two hundred and sixty (260) veterinary inspectors and one hundred and forty (140) lay assistants.

This division is maintained for the sole purpose of protecting our live stock interests from infection from outside sources, and also for the purpose of controlling and eradicating serious contagious diseases within our borders. In order to prevent the introduction of disease from outside sources, quarantine stations and inspection ports are maintained along the international boundary, as well as on the Atlantic and Pacific seaboards. Practically all of our overseas importations arrive at the Atlantic seaboard and the majority of these are consigned to the Quarantine station at Quebec.

The live stock interests of the Dominion are constantly increasing in importance, and especially in view of conditions resulting from the war, the value of maintaining an efficient effective force for the control and, where possible, the eradication of contagious animal diseases cannot be over estimated. Work of this nature, involving

the performance of so much professional work of a very important and responsible character, necessitates careful selection of the officers upon whom the responsibility must largely rest. Difficulty is, therefore, constantly experienced in maintaining an adequate efficient force to combat outbreaks of animal diseases which may at any time occur in varying degrees of severity.

It was found many years ago advisable to absolutely prohibit the importation of cattle, sheep, other ruminants and swine from many of the countries of Europe, owing to the introduction of contagious pleuro-pneumonia into the United States from that source.

It is very unfortunate that action of this kind is necessary, owing to the fact that our live stock breeders have been unable to import certain strains of certain species of animals, which are highly desirable. It would, however, be the height of folly to permit any of these importations from these countries so long as serious transmissible diseases of live stock are known to exist. War activities in these countries have increased the danger, and with a view to protecting our live stock interests from the possible introduction of infection from these countries through the medium of our returned soldiers and their supplies, it has been found necessary to prohibit the importation of any horses known to have been in those countries. With the return of our soldiers there is an ever existing danger of infection being introduced into this country, and it will, therefore, be necessary to exercise the greatest vigilance for some time to prevent or control any outbreak of a foreign disease which may at any time be detected in this country. The importance of preventing such outbreaks cannot be overestimated, especially in view of the necessity of greater production in all lines of agriculture. It is essential, therefore to maintain an adequate and efficient staff of officers who are entrusted with this most important work.

The statistics for the year 1918-19 will be found in the special report of the Veterinary Director General, which will, I think, show that the policies of my department are sound and practical.

The attention of my officers has been directed in the field principally to suppressing outbreaks of hog cholera, mange and glanders.

HOG CHOLERA.

Hog cholera is more evenly distributed throughout this country than any of the other diseases with which we deal. This is undoubtedly largely due to one of the common sources of infection, that of feeding garbage to hogs, which contains scraps of infected pork and bacon.

Experiments have shown that the infection of hog cholera is not destroyed by the curing and smoking processes, and that when pieces of hams or bacon, obtained from carcasses of infected animals, are fed to hogs, the disease is quickly transmitted. My officers have experienced so much trouble in dealing with outbreaks due to this cause that, upon the recommendation of the Veterinary Director General, it was found necessary to control the feeding of garbage to hogs from premises other than those on which it was produced. The licensing of garbage feeding premises has given good results, but there are large feeders who object to the cooking of the garbage. The

department has, however, insisted upon the feeding of cooked garbage only, with the exception of a few cases where the hogs had been immunized by my officials by the use of the simultaneous treatment of virus and serum. Fortunately the hog cholera situation in this country does not justify the general use of the virus, and so long as the outbreaks can be controlled as expeditiously as they have been in the past, it is not my intention to permit the use of virus except in special cases.

Serum is used by my officers when dealing with outbreaks of this disease. All hogs on infected premises not showing any clinical symptoms of hog cholera are injected with serum by a veterinary officer and the place quarantined, instead of, as in the past, being slaughtered and burned and buried. This policy has not in any way interfered with the prompt control of the disease and has been advantageous, owing to the fact that large quantities of pork have been saved which otherwise would have been destroyed.

MANGE IN CATTLE AND HORSES.

Cattle mange is still giving my officers considerable trouble in the infected territory in the Provinces of Alberta and Saskatchewan. Although our statistics show that the number of actually infected cases has decreased, trouble has been experienced owing to the fact that a few shipments of infected cattle have been detected in the United States markets. This resulted in the United States authorities exercising more care in the enforcement of their regulations, which interfered with the free market of cattle from the infected area. In view of the importance of the United States market to our live stock breeders, the Veterinary Director General has arranged to visit Washington immediately, with a view to placing the facts in connection with the mange situation clearly before the authorities there, and I have every reason to believe that, with the facts before them, satisfactory arrangements will be made. Very careful consideration has been given to the best means of eradicating mange, and various opinions have been expressed by those interested. It is encouraging to note that the stockmen are becoming more concerned regarding the eradication of this disease, as their co-operation is essential in dealing with malady of this kind under the many difficulties inseparable from range conditions.

The area in question is a large one, and it is, therefore, not an easy matter to deal effectively with animals running on unfenced lands. There is, however, a large portion of this area on the western boundary in which very little mange has been detected for some time. I am, therefore, considering the advisability of removing this area at an early date from the infected territory.

It may also be possible to remove other areas on the eastern boundary of the infected territory. It is, I think, essential to reduce the area immediately it is safe to do so and to concentrate our efforts in a smaller territory. There are so many difficulties to encounter in the treatment of these animals: weather conditions frequently make it impossible to hold a large number of cattle which have been dipped once for a second dipping, and many of them, during storms, travel long distance and come in contact with stock which have hitherto been unexposed to infection. If, therefore, it is possible to reduce this area much greater progress can be made.

GLANDERS.

This dangerous disease of horses, mules and asses has been kept under control during the past period. The largest number of cases, as in the past, have been dealt with in the Province of Saskatchewan. Nova Scotia, New Brunswick and British Columbia have been free from this disease, while only one case has been found in Ontario, three in Quebec and eight in Alberta. A few cases have been dealt with in Manitoba, the infection in these cases having originated outside of this province.

The compulsory slaughter and compensation policy enforced by this Branch has been practical and effective. The careful investigation of all suspected cases and the careful inspection and test of import horses without doubt keep the disease under satisfactory control, and finally result in its eradication. The number of cases dealt with during the past year, when compared with those of a few years ago, would indicate that glanders has been adequately suppressed and that the possibilities of big outbreaks of this disease occurring in the future are very slight.

DOURINE.

This troublesome disease has also been practically eradicated during the last few years. My department has been fortunate in preventing its dissemination to any extent from the district in which it was first detected many years ago. It has, however, been necessary to destroy a large number of valuable animals infected with this malady in order to control the disease. During the past fiscal year there have not been more than twenty animals destroyed. The majority of these cases were suspects, and as the animals were not of great value, it was considered wise to destroy them and pay compensation therefor.

SHEEP SCAB.

This disease has not been detected in any province in this country, except Manitoba, during the past year. In Manitoba only six cases were dealt with in a district in which the disease has been known to exist during the past two years.

In order to protect our flocks from infection from outside sources a thirty days' quarantine is still required for all breeding sheep from the United States, unless they are accompanied by a certificate signed by an officer of the Federal Bureau of Animal Industry, stating that they have been twice dipped under official supervision. An exception to this ruling is made in connection with sheep from the States of Washington, North Dakota, Montana, Idaho, and Wyoming. Sheep from these states are permitted entry without quarantine if accompanied by a federal certificate stating that the sheep have been inspected by a federal officer and found free from disease, and that no serious diseases of sheep exist in the county or counties in which the animals originated. All sheep are, however, carefully inspected by one of my officers upon arrival at the boundary.

ANTHRAX.

This very serious disease affecting all domestic animals, as well as man, is seldom dealt with in this country. Some very serious outbreaks have been encountered in the

past. In recent years the majority of the outbreaks have been due to infection introduced by foreign hides and have occurred in the vicinity of tanneries. During the past year, however, only two very small outbreaks occurred in the province of Quebec.

In view of the importance of safeguarding our interests from infection of foreign origin, all hides coming from countries in which this disease is prevalent, are held at the port of entry and are not permitted to go to destination unless it is found that the purchasers have suitable facilities for the disinfection of these hides. Shipments are unloaded under the supervision of my officers, who take immediate measures for the disinfection of the car in which the hides were conveyed, as well as of all contact matter, including the boots and clothing of the persons engaged in handling the hides. The hides are removed to a convenient location where they are stored and placed in vats containing suitable disinfectants, as rapidly as facilities will permit.

Anthrax vaccine for immunizing purposes is manufactured by the pathologists of this branch and is supplied to veterinarians at cost.

The quarantining of infected premises and immunization of all contact animals has had a beneficial effect in controlling the few outbreaks which have occurred.

RABIES.

This very serious disease has fortunately not been detected during the past year in this country.

TUBERCULOSIS.

Careful consideration has been given to the suppression of this disease. No change, however, has been made during the past year in the policy which has in recent years been followed in dealing with this malady. Owing to its wide prevalence its suppression is attended by very many difficulties, and as it is quite impracticable to take drastic measures in an endeavour to control tuberculosis, unless the live stock men are in accord with our policy and are willing to co-operate with us, it is essential to exercise caution. I have not, therefore, so far found it advisable to inaugurate a compulsory slaughter policy, with compensation payment, with the exception of animals slaughtered under the Municipal Tuberculosis Order. This order is limited to municipalities having by-laws requiring licensing of all dairies. The order has been in force for several years, but until quite recently very few municipalities took advantage of it. There has, however, been no undue difficulty in its enforcement, and the municipalities have been well satisfied with its provisions.

Progress is also being made in the eradication of this disease in herds placed under the supervision of my department. The number of these herds has gradually increased and my officers make systematic tests of all cattle in these herds and also make tests of any animals which are purchased before they are brought into the herd. I have not, however, considered it good policy to insist upon the slaughter of reactors in these cases or to pay compensation therefor. The owners are permitted to take whatever measures my officers consider safe in disposing of the reactors, and they, therefore, obtain the market value of the carcases in all cases found to be fit for food purposes

Records of tests of cattle in these supervised herds, as well as the herds tested under the Tuberculosis Order, show quite clearly that the eradication of tuberculosis is a practical problem. It has been found that after the first reactors are taken from the herd, with few exceptions the retests of the same herd reveal a very small percentage of reactors.

In order to protect our live stock interests from infection from outside sources, cattle imported into this country for any purpose other than immediate slaughter, are tested with tuberculin either by an American officer of the Bureau of Animal Industry or by one of the officers of the Health of Animals Branch.

The tuberculin which is used in making the official tests is manufactured by the pathological staff.

In order to encourage the testing of cattle, the department supplies this tuberculin free of charge to veterinarians under certain conditions. The veterinarian conducting the test must forward to the veterinary director general a report of the test and all reacting cattle must be held until they have been permanently earmarked by one of my officers. Although the department takes no further action with these cases, an observant purchaser soon recognizes the official mark and knows that the animal has been declared to be affected with tuberculosis.

LABORATORIES.

The work in the laboratories located at Ottawa, Lethbridge and Agassiz, has been of great value to the live stock intersts throughout this country. Numerous specimens are continually being received at these laboratories for diagnostic purposes, and full information is forwarded to the persons sending these specimens.

At the Ottawa laboratory many biological products are manufactured for diagnostic and immunizing purposes, which are used in controlling outbreaks or disease.

It has also been necessary to conduct research work, but owing to the very limited accommodation at these laboratories, it has been impossible to give this particular work the attention which it deserves. As it is essential to give more attention to important research work, the department has recently acquired a suitable property in the vicinity of Hull. It is my intention to equip a suitable laboratory on this property, as well as stables and other buildings to facilitate investigation of this nature.

MEAT AND CANNED FOODS DIVISION.

The work of this division has been unusually heavy owing to the increased demand for foods for army and civilian needs in Great Britain and the allied countries. This work has been carried on by my officers under excessive strain and labour due to the fact that it was impossible to obtain any further help. This shortage of help was intensified by the fact that the War Purchasing Commission requested a final inspection at the seaboard, also certification as to count and weight. The loyalty of the members of the staff is appreciated, and the thoroughness with which they performed their work is attested by the following statement made by the British authorities to their representative: "We are instructed to place on record the British

Ministry of Food (London's) appreciation of the work that they have done, the proof of which is the exceptionally small number of complaints which have been received—in number fewer than the complaints which would have been received in normal times."

During the year the Meat and Canned Foods Act was amended so that all imports of the various foods covered by the Act are subject to the same requirements as those manufactured in Canada. Authority was also granted whereby the Governor in Council may bring within the operation of the Act any food or food products other than those specially mentioned.

A number of prosecutions were instituted during the year for violations of the Act and in all cases a conviction was secured and penalties imposed.

In order to protect consumers of canned fruits and vegetables and their products, new regulations were passed in which standards of quality were defined. While it is more or less impossible as yet to state fully the beneficial effects of such standards, there is now no reason why the purchaser should not know the contents of the package as the label must truthfully describe the product. This will permit the selection of the quality desired and will encourage the packing of a high class article which will not be undermined by the cheaper grades, as was the case when the quality was not defined by statute nor specified on the label.

A number of new establishments were placed under the operation of the Act during the past twelve months. Inspection was refused to others owing to their construction and sanitary equipment not being up to the standard required.

We were able during the year to make large sales of condensed milk to the allies upon our furnishing full information regarding weight and quality. Hundreds of samples were taken and tested, and with few exceptions the requirements of the Allied Purchasing Commission were complied with.

During the fall we were able by having our new standards of quality in force to sell to the British Government all our surplus stock of evaporated apples. This product was graded and marked by my officers and an official certificate issued. The value of this work cannot be overestimated since it furnished to our foreign customers a Government guarantee as to quality and thereby prevented the possibility of inferior products leaving Canada, which could not have done other than damage our export trade which is so essential at the present time.

There will in all probability be an amendment to our present regulations whereby it will be made illegal to export any food or food products coming under the Act unless they have been specially examined and an official certificate issued.

THE FRUIT BRANCH.

It is with deep regret that I record the death of Donald Johnson, which took place on August 4 last. Mr. Johnson was appointed Dominion Fruit Commissioner in May, 1914, on the formation of the Fruit Branch as a separate branch of the Department of Agriculture, and for four years worked diligently and conscientiously to promote and foster the best interests of the fruit industry. He was obliged through ill health to leave his office in May, 1918, and died at his home in Forest, Ontario, less

than three months later. The work of the branch was subsequently carried on by Mr. Fred. H. Grindley as Acting Commissioner until the appointment of the present Commissioner, Mr. C. W. Baxter, the latter part of October. Mr. Baxter has been on the staff of the department since 1912, first as Chief Fruit Inspector for the Prairie Provinces and, more recently, as Chief Fruit Inspector for Eastern Ontario and Quebec. At the time of his appointment to the position of Fruit Commissioner he was temporarily employed by the Canada Food Board in charge of the Enforcement Section.

THE FRUIT SEASON.

The severe cold weather during the winter of 1917-18 had a serious effect upon apple orchards, particularly in Ontario and Quebec. Reports of winter injury became more serious as the season advanced and it was apparent that many trees had been completely killed. Famouse orchards in eastern Ontario and Quebec were particularly affected. In Nova Scotia early reports indicated a heavy decrease in yield, as compared with the previous season, but the total crop finally harvested was approximately the same. British Columbia produced an apple crop slightly less than that of 1917. Apple scab was fairly prevalent in all parts of Canada, but not so much so as in previous years. A fairly large proportion of No. 1 fruit was therefore marketed.

The removal of the apple embargo in November permitted the export of apples to Great Britain during the remainder of the season. In Great Britain the primary distributors' maximum prices was fixed at 6½d. per pound and the retailers' maximum price at 9d. per pound. Ocean freight rates opened at $5 per barrel and $2 per box but were later reduced to $3 per barrel and $1.25 per box. These rates and fixed prices were such as to leave a very fair margin of profit for the Canadian shipper. Over 200,000 barrels of apples were exported from Nova Scotia, as well as a considerable quantity from Ontario.

Peaches were only a medium crop in British Columbia and Ontario. A severe frost on May 24 greatly reduced the yield of peaches and other tender fruits in British Columbia.

Pears and plums were a light crop in Ontario, especially early varieties. Later varieties, such as Lombard and Reine Claude, gave heavy yields in the Niagara District. In British Columbia the yield of plums was good; pears gave a fifty per cent increase over the previous season.

Small fruits were generally light and prices exceptionally high. Grapes were a light to medium crop in the Niagara Peninsula.

AMENDMENTS TO FRUIT MARKS ACT.

The amendments to Part IX of the Inspection and Sale Act, which had been recommended at a conference of representative fruit growers in March, 1918, were approved by Parliament on May 24. Some of these became effective at once, while those covering the size of fruit packages were to become effective on June 1, 1919. It was found, however, later in the season, that the dimensions of the eleven and six quart climax baskets, as amended, were not satisfactory. A number of meetings

were therefore held and an effort made to prescribe and agree upon the dimensions of a standard form upon which these baskets should be made, rather than attempt to define the dimensions of the baskets themselves. The measurements of the required forms have now been obtained, and pending the necessary legislation, the use of the old style package will be continued without interference or restriction by this department. Some changes have also had to be made in connection with the standard apple barrel and those will be made legal at the same time as those governing the climax fruit baskets. It is therefore to be supposed that, after the coming fruit season has passed, the standardization of all fruit packages will have been completed

WEIGHTS OF POTATOES, ETC.

Owing to certain inconsistencies in the sale of potatoes in bags, it was thought desirable that the regulations compelling the use of the 90 pound bag should be enforced by the inspection staff of the Fruit branch. These regulations were embodied in Part X of the Inspection and Sale Act (Sections 337, 338, 356 and 357) and had previously been under the supervision of the Department of Trade and Commerce. Their enforcement had not, however, been possible owing to lack of adequate inspection staff. In August, 1918, therefore, an arrangement was made between this Department and the Department of Trade and Commerce whereby these sections were transferred to the Fruit Branch for enforcement. Much has already been done to check the sale of potatoes in other than the legal bag, and the difficulties previously experienced by purchasers, on account of the varying weights of bags, will be soon overcome.

FRUIT CROP REPORTS.

Fruit crop reports were published monthly from June to October inclusive and covered very fully the situation in all parts of Canada as the season advanced.

Telegraphic reports were also published from August to February twice weekly. In order to effect a more rapid delivery of these telegraphic reports, rendered necessary on account of frequent changes in market quotations, they were published simultaneously at Vancouver, Winnipeg, Ottawa, and Middleton, N.S., for local delivery. This change was of very great benefit, and was continued from October until the end of the calendar year. It is proposed to adopt the same plan again the ensuing year, introducing it in August to cover shipments of tender fruits as well as apples.

FRUIT EXHIBITS.

To stimulate public interest in the fruit industry and to increase the consumption of Canadian apples particularly, an attractive exhibit was made at the Canadian National Exhibition in Toronto, and was awarded the gold medal. A similar exhibit was made at the Horticultural Show at St. Catharines in September. In connection with these two exhibits a free distribution of an "Apple Recipe" book was made, of which 30,000 copies were printed. Practically all of these reached the hands of housewives and others who would be likely to make good use of them.

ONION AND POTATO GRADING.

Some attention has been given to the question of establishing uniform grades for onions and potatoes and enforcing the compulsory grading of these commodities. Before attempting to proceed with the preparation of legislative measures, it was considered advisable to obtain an expression of opinion from those concerned. A circular letter was therefore sent to growers' associations, individual growers, and dealers throughout the country. From several hundred replies received it is apparent that compulsory grading will meet with marked general favour. During the coming season it is proposed to call together representatives of the several provinces in order to proceed with the definition of grades and the drafting of the necessary legislation.

CO-OPERATION WITH CANADA FOOD BOARD.

As in the previous year, members of the Fruit Branch have assisted in the enforcement of the regulations of the Canada Food Board. Practically all of the fruit inspectors have aided in the collection of license fees, which were forwarded to the Food Board through the office of the Fruit Commissioner. In fact, all intercourse and correspondence between the Food Board and the fruit inspectors was transacted in that manner. An office was established by the Food Board in Toronto and another in Hamilton, of which Mr. J. R. Hastings, acting Chief Fruit Inspector for western Ontario, took charge. On the appointment of Mr. Baxter as Fruit Commissioner in October, Mr. F. H. Steele, Chief Fruit Inspector for the Prairie Provinces, took charge of the enforcement section of the Canada Food Board at Ottawa, and continued in that work for three months, after which time the work of the Board had so lessened that the assistance and co-operation of the Fruit Branch was no longer necessary. During the year much valuable aid was also given to the Canada Food Board by Mr. Geo. E. McIntosh, officer in charge of transportation in the Fruit Branch. An outline of this work is included in this report under the heading "Transportation."

TRANSPORTATION.

The transportation work of the Fruit Branch is under the direction of Mr. Geo. E. McIntosh. During the past year Mr. McIntosh visited the western provinces in July and August to inquire into the complaints of shippers, to interview railway officials, and to adjust, so far as he was able, difficulties arising from carload minimums, rates, switching privileges, station facilities, etc. He also attended, in February, sittings of the Railway Commission in all provinces, in connection with the proposed increase in express rates.

Much help was given to the Canada Food Board in the enforcement of Order in Council No. 3430, which prohibited unnecessary delay in the unloading of cars containing foodstuffs. This office dealt with over one thousand cars, reported by the railway companies as being delayed at destination under load. These cars contained practically every variety of food and their prompt unloading was enforced by this office up to the point of seizure; when that became necessary they were referred to the Canadian Food Board. By this means an inestimable amount of waste was prevented.

In September Mr. H. H. Shaeffer was temporarily appointed in Nova Scotia to assist fruit shippers in obtaining cars for Canadian shipments and for export shipments, and to take care of their requirements, as much as possible, when there was a shortage of cars on the Dominion Atlantic Railway, by obtaining them through the Canadian Pacific Railway. He also assisted in obtaining ocean space and in advising shippers as to proper routing of shipments, etc. Mr. W. P. Fox was similarly employed on Prince Edward Island to aid in the movement of potatoes from that Province.

A number of circulars have been sent out from Ottawa informing shippers of changes in classifications, tariffs and shipping regulations generally.

In co-operation with the British Ministry of Food and the British Ministry of Shipping in Montreal, assistance was given in the allotment of space for export shipments of apples after the embargo had been lifted.

INSPECTION WORK.

Owing to the light crop of apples, particularly in Eastern Canada, it was possible to make a reduction in the staff, and only thirty-two temporary inspectors were appointed during the past season as compared with forty-four in 1917-18. In addition to these men, who were employed for periods from three to six or seven months each during the active fruit season, there are twelve permanent inspectors on the staff in addition to the chief inspectors. The country is divided, for inspection purposes, into five districts, with a chief inspector in charge of each. These districts with the number of inspectors located in each during the season of 1918-19 were as follows:—

The system of inspection at point of shipment has been continued and gives most satisfactory results. In addition to examining large quantities of fruit packed in the orchard or at the shipping station, our men are able to give valuable information to fruit growers and packers relative to all matters concerning the packing, grading, shipping and marketing of their fruit. This educational work forms a very considerable part of the inspectors' duties, and is much appreciated by growers, packers and shippers, and has a positive value to the consuming public inasmuch as the presence of our inspectors in the orchards and packing houses has had a marked effect in lowering the number of shipments of improperly packed and falsely marked fruit.

For many years the inspection of apples formed the chief work of our inspectors but since 1915, in response to requests from growers, shippers, dealers and consumers, more attention has been paid to the inspection of other fruits, including strawberries, cherries, plums, etc. The chief complaints regarding these fruits were with respect to immature shipments, which had a very disastrous effect on the market for later and properly matured fruit, the over-facing of basket fruit and the failure to properly fill open packages. While the presence of our inspectors had already caused considerable improvement in these matters, it has been possible to secure much more direct results since these points have been covered by the amendments of May 24, 1918. During the past season our inspectors have spent a great deal of time in familiarizing packers and shippers with these amendments, which cover the points already mentioned and also provide for more definite grades, a clearer definition of over-facing and for the standardization of all the fruit packages in common use in Canada.

All cases of violation of the Act have been investigated by the chief inspector for the district in which the packed lived, but slightly more leniency was shown in taking action against these offenders during the past season than in former years, owing to the unsettled condition of the industry, particularly in connection with labour, and also owing to the fact that many of the packers were ignorant of or did not thoroughly understand the requirements of the amendments of 1918. The convictions secured during the past season were twenty-two.

As in former years the permanent staff have been able to give considerable assistance, in co-operation with the provincial and local authorities, in connection with orchard demonstrations and meetings to encourage improved orchard practice and modern methods of packing, grading, shipping and marketing. The inspection of basket factories was also continued. Many of our inspectors acted as instructors at courses in box and barrel packing; and a number have been asked to serve as judges at fruit exhibitions.

Special efforts were made during the past year to assist in the settlement of disputes between shippers and dealers. In the past losses and waste of fruit and vegetables have occurred frequently through consignees refusing to accept cars for various reasons. To facilitate prompt delivery, ensure fairness to both consignee and shippers and to avoid unnecessary waste, our inspectors during the past season have been authorized to make inspections of such cars or shipments upon request of either shipper or consignee, sending copies of their reports, showing the exact condition of the goods, to the applicant. Many shippers and consignees have taken advantage of this service, which has resulted in the satisfactory settlement of many cases and the prevention of waste of food.

INSPECTION STATISTICS.

The following table gives comparative statements of the number of lots inspected and the number of packages inspected for the seasons 1914-15 to 1918-19 inclusive:—

Variety		No. of lots inspected.	No. of pkgs. in lot inspected.	No. of pkgs. inspected.
1914-15.				
Apples	Barrels.	8,926	765,445	59,602
"	Boxes.	2,769	457,055	36,118
"	Baskets.	191	29,476	3,994
Crab Apples	Boxes.	38	2,443	951
Pears	"	894	91,121	9,760
Peaches	"	735	183,952	10,035
"	Basket.	147	17,797	2,422
Plums	"	643	180,154	12,294
Tomatoes	"	305	103,742	12,171
Small Fruits	Quarts.	1,162	1,529,598	151,599
Grapes	Baskets.	244	308,728	22,394
			Total	321,300
1915-16.				
Apples	Barrels.	8,882	810,858	60,248
"	Boxes.	4,246	758,337	46,791
"	Baskets.	204	14,319	1,797
Pears	Boxes.	1,062	121,414	8,816
Peaches	"	1,(22	270,508	12,575
"	Baskets.	838	106,569	10,796
Plums	"	998	482,416	22,231
Tomatoes	"	633	200,343	7,926
Small Fruits	Quarts.	1,724	2,670,984	275,234
Grapes	Baskets	260	3?2,332	11,395
			Total	457,809
1916-17.				
Apples	Barrels.	6,412	404,597	43,359
"	Boxes.	2,337	579,148	32,420
"	Baskets.	188	14,472	1,332
Pears	Boxes.	200	108,426	6,108
Peaches	"	1,179	289,560	15,612
Plums	Baskets.	609	158,133	7,215
Tomatoes	"	624	136,993	5,812
Small Fruits	Packgs.	2,039	282,365	99,799
Grapes	Baskets.	193	273,435	7,951
			Total	219,608
1917-18.				
Apples	Barrels.	5,652	379,496	40,117
"	Boxes.	3,157	908,892	35,888
"	Baskets.	196	16,146	1,709
Pears	Boxes.	779	112,717	4,954
Peaches	"	1,303	224,228	14,481
Plums	Baskets.	773	195,084	5,952
Tomatoes	"	652	158,971	6,383
Small Fruits	Packgs.	1,312	248,539	14,657
Grapes	Baskets.	135	153,027	3,415
			Total	127,536
1918-19.				
Apples	Barrels.	4,861	382,653	36,947
"	Boxes.	2,431	760,307	26,769
"	Baskets.	122	19,614	1,212
Pears	Boxes.	576	101,675	4,267
Peaches	"	794	242,735	8,806
Plums	Baskets.	515	182,286	4,576
Tomatoes	"	394	145,113	3,630
Small Fruits	Packgs.	852	173,567	11,616
Grapes	Baskets.	106	198,336	2,126
			Total	198,949

ENTOMOLOGICAL BRANCH.

The work of this branch has comprised: the administration of those regulations under the Destructive Insect and Pest Act affecting insect pests including the inspection and fumigation of foreign nursery stock or other plant products; the suppression of the brown-tail moths in Nova Scotia and New Brunswick; the study of the natural control of insects and the introduction and colonization of parasitic and predacious insects; the conducting of investigations on insects affecting farm, garden and orchard crops, forest and shade trees, grain and stored products, domestic and other animals, household and public health, and the dissemination of information concerning the control of such insect pests; the naming of collections of insects for institutions and individuals; and the administration of an appropriation for the care of orchards on the Indian reservations in British Columbia.

In addition, the chief officer of the branch, in his capacity as Consulting Zoologist, has been called upon to advise on questions relating to the protection and encouragement of birds, the conservation of mammals, and the destruction of noxious species.

While the main work of the officers of the branch has been investigation, they continued during the season of 1918 the policy that has been adopted during the war of giving special attention to the work of assisting increased production by promoting crop protection. Certain of the officers have devoted their entire time to demonstration and other forms of extension work on crop protection, and results of material value have accrued. So useful have the branch laboratories proved as means of increasing the scope of our investigations and of getting into closer touch with farmers and others whose interests we are serving that in order to meet the increasing demands for assistance in this work it has been necessary to increase the number of assistants at these laboratories.

The following is a brief summary of the various lines of work that have been undertaken during the last year by the officers in charge of these laboratories and under the direction of the Dominion Entomologist:—

Annapolis Royal, N.S.—The control of insects affecting orchard crops and potatoes including very extensive experimental tests on the comparative killing value of different insecticides used alone and in combination with fungicides, and their effect on foliage. Our recommendations concerning the use of arsenate of lime as a substitute for the more expensive arsenate of lead has been widely followed with satisfactory results. Work was conducted in numerous demonstration orchards and extensive demonstration work was undertaken on potatoe spraying, in consequence of which increased yields were obtained in many districts. This laboratory now constitutes the headquarters for investigations on insecticides.

Fredericton, N.B.—The brown-tail moth work in the Maritime Provinces is directed from this laboratory which is also the headquarters for the work of introducing and establishing the parasitic and predacious enemies of the brown-tail and gipsy moths, and for the investigations we are conducting on the natural control of insects. Satisfactory progress has been made in the studies of the natural control

of the spruce budworm, tent caterpillars, fall webworm, and oyster shell scale, which are being studied throughout their range in Canada. In addition to the foregoing lines of work, the crop protection work in New Brunswick has been carried on from this laboratory and valuable extension work has been accomplished.

Hemmingford, P.Q.—The work of this laboratory has consisted mainly in conducting experimental and demonstration work on the control of insects affecting orchards and potatoes. Over twenty orchards were utilized and in addition to spraying investigations on the use of dust insecticides were carried out. In the dairying sections the distribution and control of the warble fly are being studied.

Fort Coulonge, P.Q.—During the past year a laboratory has been established at this place for forest insect investigations after profitable preliminary work in the previous year. The main work consists of an extensive study of timber boring beetles.

Vineland Station, Ont.—Investigations on aphids and on insects affecting small fruits have constituted the chief work of this laboratory. Special attention was paid to the pear psylla; and comparative tests of orchard sprays were also made. Certain pests peculiar to greenhouses were investigated.

Strathroy, Ont.—White grub investigations form the chief work carried on at this laboratory. Attention has also been paid to insects affecting the principal field crops in western Ontario.

Treesbank, Man.—The officer in charge of this laboratory devotes most of his attention to the study of insects affecting cereal crops and their control. This work has included in particular investigations on the western wheat stem sawfly and grass stem maggots. The White grub studies commenced in 1914 have been practically completed.

Saskatoon, Sask.—As a result of work carried out in 1917 it was decided to establish a laboratory for Saskatchewan at Saskatoon where the main work consists in a study of insects affecting live stock. Both flies, horse flies and black flies are now receiving attention.

Lethbridge, Alta.—The absence on military service overseas of the officer stationed at this laboratory and his assistant rendered it necessary to discontinue temporarily our work there.

Vernon, B.C.—This laboratory now constitutes the head quarters for our entomological investigations in Britsh Columbia. The attention of our officers has been devoted chiefly to the major pests affecting the fruit-growers' interests, such as codling moth, and peach twig borer. In addition certain insects, such as onion thrips and maggot, affecting important local crops have been studied.

Victoria, B.C.—The work in the southern portion of Vancouver Island, of which the control of the strawberry root weevil is the most important, is carried on from this laboratory.

Agassiz, B.C.—In order to extend the investigations on the natural control of insects and to study in British Columbia the outbreak of the insects now under investigation, an officer was stationed at this laboratory during the past year.

At Ottawa the investigation of white grubs and of the control of root and onion maggots was continued on a more extended scale with promising results.

In order to facilitate further the importation of nursery stock from the British Isles, the city of Quebec was made a port of entry for nursery stock originating in Europe.

The inspection, under the provisions of the Destructive Insect and Pest Act, of nursery stock originating in Europe, Asia and the New England States was continued. The increased transportation charges and shipping difficulties caused a further decline in the number of trees and plants imported, but altogether about one and one-quarter million were inspected and a number of foreign pests were intercepted.

The campaign against the brown-tail moths in Nova Scotia and New Brunswick has been responsible for the attainment of a situation which may be regarded on the whole as being satisfactory. This condition of affairs is due solely to the careful scouting for and destruction of winter webs that has taken place each winter. A further reduction in the abundance of this pest in both provinces was brought about; in Nova Scotia 3,024 winter webs were collected during the winter 1917-18 as compared with 10,019 winter webs collected during the previous winter, and in New Brunswick 375 winter webs were collected after most careful scouting, during the winter 1917-18 as compared with 395 winter webs collected during the winter of 1916-17.

In the investigations on the natural control of insect pests valuable information has been secured and we hope to be able to make practical use of some of our discoveries regarding the parasitism of such native insects as the tent caterpillars and spruce budworm. We were able to prove during the year that we had been successful in introducing and establishing another important species of parasite, namely, *Compsilura concinnata*.

It is very gratifying to note that our work on forest insects is being appreciated by the lumbermen and limit holders who are now realizing the significance of insect damage in forest protection. During the year, in co-operation with the Commission of Conservation, we began an important study which has for its object the determination of the various factors that govern the reproduction of our cut-over coniferous forests in Eastern Canada. On the practical application of the knowledge so gained will depend the future of these forests. Extensive dying off of balsam throughout Eastern Canada was investigated and a number of other lines of work, including further studies and a number of insects affecting shade trees were prosecuted.

During the year greater attention has been paid to insects and pests affecting stored grain and this work is being extended on account of its economic importance in relation to the storage and shipment of our chief harvest.

Miscellaneous investigations on insects affecting garden crops, greenhouses and the household have been carried out and the correspondence regarding the control of such insects continues to increase.

The study of insecticides and their application was continued and several promising combinations were made by our officers. In addition to increasing the efficiency of insecticides our object is to lower the cost of manufacture and application and thus in addition to increasing crop protection reduce the cost of crop production.

In his capacity as Consulting Zoologist the officer in charge of the branch has had to devote much time to questions relating to the conservation of native birds and mammals and the control of noxious species, particularly in his capacity as Secretary of the Advisory Board on Wild Life Protection which interdepartmental committee has been called upon to deal with many subjects during the past year.

The following publications have been issued from the Entomological Branch during the year:—

Entomological Bulletins—
No. 14. Canadian Bark-beetles, Part II: A preliminary classification, with an account of their habits and means of control. By J. M. Swaine.
No. 15. The Pear Thrips (*Taeniothrips inconsequens* Uzel) and its control in British Columbia. By A. E. Cameron and R. C. Treherne.

Entomological Circulars—
No. 11. The White-Marked Tussock Moth and its control on shade trees and orchard trees. By J. M. Swaine and G. E. Sanders.

Crop Protection Leaflets—
No. 9. The Pea Weevil. By Arthur Gibson.
No. 10. Arsenate of Lime. By G. E. Sanders.

In addition to the above publications the officers of the Branch have contributed papers embodying the more technical results of their work in the *Canadian Entomologist* and other scientific journals. Articles have also been contributed each month to *The Agricultural Gazette of Canada* on subjects to which the officers of the branch have been devoting study.

The National Collection of Insects is increasing in size and importance through the activities of the officers of the branch and the generosity of private collectors whose assistance in building up a working national collection is greatly appreciated. Owing to the increasing magnitude of the collection and the growing demand for assistance in the determination of small collections, it has been necessary to arrange for the appointment of a special officer to devote all his time to this work.

THE INTERNATIONAL INSTITUTE BRANCH.

On April 30, 1918, the president of the International Institute announced the sudden death of Mr. Santiago Aldunate, former delegate for Chili, and an honorary member of the permanent committee. Reference was made to the exceptional activity in connection with the institute, the valuable collaboration in its work, and the lucidity of the views of this devoted friend of the institute, who had been attending the meeting of the permanent committee from its inception until recently.

Reference was also made to the role being played by the institute during the war, and to the high praise voiced by Mr. Henri Sagnier before the Academie d'Agriculture de France. After referring to the prominent and able part taken by Mr. Louis Dop, representative for France, he said: "Thanks to the high inspiration and the skilful management of its permanent committee, thanks to the happily inspired special measures adopted, the Institute has been able to continue its existence and its functions in midst of the general upheaval. The facts have proved and prove every day that the governments were thus happily inspired in maintaining an institution which seems to have been created for the sole purpose of constituting a living symbol of the

works of peace. Thanks to its direct and permanent relations with the different states, the Institute can furnish reliable data almost daily on the progress of production, the preliminary forecast and final yield of crops, on the available supplies, on the variation in prices, on transportation, etc. It conducts a permanent investigation to which governments have recourse and which renders the greatest service."

That these services were real and much appreciated appears from communications from the Minister of Colonies, from the United States Bureau of Crop Estimates, and the United States War Trade Board. The latter board wrote to Mr. Lubin: "You will no doubt realize the nature of the work of our department which controls all the exports and imports. We gather our information from the most reliable sources, and we feel that your publications present an inestimable aid in view of the decisions that have to be made in connection with the exports and imports of agricultural products. Receive the expression of our high appreciation for the usefulness of your bulletins."

At a meeting on November 21, shortly after the Armistice, the president, upon meeting the permanent committee after the long holiday, made an interesting address in the course of which, among other observations, he referred to the satisfaction which must be common to all victors, neutrals, and even the vanquished, that of witnessing the world progress towards a happier future. The new treaty of peace would mark the opening of a new era where reason could be substituted for force, and where the superior and common authority would impose its decisions upon the unreasonable ambition of kings and people. He greeted with enthusiasm the prospective realization of the League of Nations.

The president referred to the fact that during the preceding four years the institute alone, among other international institutions, had not only survived but continued its work as usual; but when a great number of the officials at the beginning of the war started for opposite camps, the decision to continue in spite of all was difficult of execution. Obstacles multiplied during the course of the conflict but, in exercising great patience in the midst of such exaggeration, a practical solution was found for the problems that daily arose.

The president said in conclusion: "Our mission now becomes more vast, more complex and arduous. The intensification of production, which is urged in all countries after such a great destruction of wealth, imposes upon us new tasks and responsibilities still more grave. All the branches of our activity must furnish a considerable contribution to the work which is expected of us, not only in respect to the reconstruction of the wealth destroyed, but in order to prepare for humanity a more worthy and happier future. We must study the means of rendering more efficacious and more general the benefits that may be derived from all the progress of scientific agriculture, the sole source of greater production. We have to take up once more the examination of organization against the diseases of plants which we had to abandon a few months after the important International Conference held in Rome in 1914. We must see whether the time has not arrived, as I believe it has, to proceed to the institution of an international observatory for agricultural labour, which constituted a part of the institute's original programme and has now become a prime importance. All the numerous questions connected with the statistics of production, and more still with the statistics of trade, urgently await our solutions. We should

place ourselves in touch with existing institutions in order to render more useful, and especially more active, our studies in connection with agricultural association and credit. We should seek methods of rendering ourselves useful to the least advanced countries, and we must intensify our work in the interests of the production of tropical countries."

The late Mr. David Lubin, delegate for the United States, agreed with the president with reference to the great services the institute might render in connection with destroyed wealth. Now was the opportunity for the institute of achieving what His Majesty the King of Italy had in mind when he took the initiative in its creation. For that purpose, he would at once make a formal proposal that the permanent committee appoint a commission of five members, which should draw up a schedule of the branches of the work in which the institute might render services, either at once or in the future, and submit that schedule to the permanent committee for discussion at its next meeting. That after discussion the committee should be charged to proceed to the meeting place of the Peace Conference for the purpose of explaining the programme of the institute's work and all the facilities which it offers, so that the institute might take its place as an organ of the League of Nations, duly recognized in the final peace. This proposal of Mr. Lubin was adopted, although in a different form, it having been decided on the motion of the French delegate that a resolution be forwarded to the different governments to ask them to make the requisite representations to their representatives at the Peace Conference.

It was also at the permanent committee meeting of November 21 that the secretary general, Signor Dragoni, upon being reminded that the arrears due from certain adhering States were considerable, stated that there was an evident difference between the financial situation as it is disclosed by the table showing the arrears in the payment of contributions and the real situation. If the 520,000 lires due for 1918 were considered, it might be inferred that there was a deficit, whereas it must not be forgotten that there was collected in 1918 more than 200,000 lires of arrears in contributions of preceding years so that, while at the end of September, 1917, there was available in cash only 959,000 lires, at the end of September, 1918, there was in cash 1,200,000 lires, or an effective improvement of more than 150,000 lires. This result is all to the honour of the financial policy of the institute thanks to which, during the four years of war, the institute has really set aside one million lires, its reserve which was 200,000 lires having risen to 1,200,000 lires.

The secretary general also referred to the various communications received expressing approval of the institute's work, alluding to the Interallied Food Council, consisting of the Requirement Ministers of Great Britain, United States, France and Italy. The Director-General of Requirements wrote: "I know perfectly through my personal experience that the publications of the institute are practically the only reliable source for international statistics of cereals, and that these publications contain the best comparable data obtainable. Do not for a moment doubt that the allied countries appreciate the precious work of the institute." The secretary general referred to the communications of Weddel & Co., of London, and the American Bureau of Animal Industry, who paid a tribute to the new service which furnishes the imports and exports of meats, and who suggest further development of such statistics.

At the permanent committee meeting of December 7, the questions connected with the programme of the next general assembly meetings were discussed. Without presuming to anticipate the decisions of the permanent committee, it is of interest to state that the very able and thorough report of Professor Lorenzoni is to form the basis for discussion of the question of ocean freight rates and the control of ocean trade, a proposal long advocated by Mr. Lubin and supported by the British, French and Italian delegates. During the war the policy of ocean freight control became a reality and was resorted to much more vigorously than its author, Mr. Lubin, had expected.

Mr. Lubin's proposals at this meeting, chiefly with reference to discussion at the next general assembly meetings of the questions of pure food laws, agricultural labour, and the submission of the programme of statistics to the different food controllers, marked the closing official act in his life work. On January 1, the founder of the institute passed away, in the midst of the intense activities that had characterized his whole career. Having been constantly in intimate relations with the allied leaders charged with the regulation of the food supply during the war, his scheme contemplating the control of ocean freight rates and the constitution of an international Reserve Board along the lines of that existing in the United States, undoubtedly exercised a powerful influence in the systems of control which actually prevailed. All of his important proposals to the International Institute have borne good fruit. He has shown the practicability of an international institution of very wide scope and usefulness. Through many years of continuous active propaganda issued chiefly from its offices, he has effectively worked towards popularizing the ideas underlying the League of Nations which, at the moment of his death, was on the point of becoming a reality. In this, as in all his work, it is now generally recognized that he was a most effective champion of the world's agricultural interests. On March 27 the Canadian Senate passed an appropriate resolution commemorating his notable career.

The seventh volume of the "International Year Book of Agricultural Legislation," containing all the laws, decrees and ordinances of interest to agriculture promulgated in 1917 in all countries, was published in the fall of 1918. The exceptional conditions in which the legislation of 1917 had risen give a special interest to this volume. It contains a faithful picture of the effort made by each country to regulate production and the food supply. The work is published in French only, but the English introduction of 60 pages traces clearly the general lines followed by the year's legislation.

A notable example of the laws published in this series of year books is the Act of the British Parliament of May 31, 1917, consolidating in a single text all the regulations relating to the defence of the realm since the outbreak of the war. Other examples are the United States Federal Farm Loan Act of 1916, and the law of the Union of South Africa, June 23, 1917, concerning the trade in manures, food for live stock, seeds and substances used to combat the disease of plants. The texts of several measures relating to the regulation of prices and the taxation of income and profits have also been given.

Besides furnishing the information desired at the headquarters of the institute, it is the duty of the International Institute Branch to turn to good account and enable

Canadians to reap the maximum of benefit from a Government expenditure, outside of Canada, of some $150,000,000 annually on agriculture. It is the business of the officials at the Rome headquarters to concentrate the essential features of the information, to emphasize scientific discoveries and practical progressive methods of applying newly established scientific principles, and particularly to cultivate a disposition among all the agriculturists of the world to co-operate for their common welfare. They realize these objects by means of their periodical public meetings in the nature of world's parliaments of agriculture, but more effectively perhaps by means of their permanent bureau among the 100 members of which some of the world's distinguished experts are constantly at work for the common cause. They present the results of their work in the form of publications devoted to (1) Crop Reporting and Commercial Statistics; (2) Review of the Science and Practice of Agriculture; (3) Review of Agricultural Economics, Organization and Administration; (4) also a supplementary report, created since the war, dealing with tropical products, the trade in live stock, foodstuffs and fertilizers, the scattered character of whose statistics does not permit of regular classification for the purpose of presenting a maximum of comparable world-wide results, such as can be done more effectively for the cereal crops; (5) regular annual publications, such as the "International Year Book of Agricultural Legislation."

The Institute Branch at Ottawa is not only possessed of this information in the summary form in which the institute publications necessarily issue it, but the branch also procures the original publications and periodicals from which the summaries were prepared, and any other obtainable literature on the same subject, and all this material is made easily accessible to Canadians, whether in Ottawa or elsewhere.

Brief indications of this rich material are communicated monthly to the *Agricultural Gazette*, and periodically special investigations of the world's cereal situation are made and the results prepared in the same manner. The branch's work tends to bring Canadians to a realization of the fact that, however important is their own work and their own agricultural expenditure of some $10,000,000, they also derived full benefit of a larger world expenditure, thus made in a considerable degree gratuitously available to them; to bring them to realize that they should reap the benefit, not only of the excellent and more directly applicable work of their own experts, but also the comparable and adaptable results of the work of a much larger body of experts labouring in other countries under different conditions. It appears from the preceding reports of this branch that the agriculturists of Canada, especially the expert administrative and teaching bodies, are gradually becoming better acquainted with the facilities offered by this permanent commission and centre of inquiry for foreign agriculture.

Some of the subjects on which information was sought by written inquiries received from Canada and outside of Canada, and furnished during the year, were: "The wheat problem in the United States and Canada"; "Exploitation of capitalist farms in Egypt"; "Dry Farming"; "Desiccation of Potatoes"; "Nettle Fibres"; "Implements exhibited at agricultural shows"; "Agricultural conditions in Poland"; "Agriculture in Japan, China, and India"; "The live stock situation at the end of the war"; "The world's food situation"; "The

world's supply of cereals"; "Per capita consumption of agricultural products in various countries"; "World's trade in agricultural products"; "Cost of production of agricultural products"; "Consumption of Fertilizers"; "Co-operative organization of farmers in Canada"; "Agricultural credit in various countries"; "Insurance against frost and drought."

During the year the usual contributions were made by this branch to the *Agricultural Gazette*. These included the continuation of the series of original articles, begun in 1916, on the world's food supply. The articles published in the past year were: "Bacteriological Analysis of Pellagra-Producing Diets"; "The Wheat Crop of 1917"; "World's Wheat Prospects for 1918-19"; "Food Prospects under Peace Conditions"; "World's Live Stock." The more important articles republished from the original Institute Bulletins were: "The Problem of Agricultural Meterology"; "The Effect of one Growing Plant upon another"; "Marquis Wheat"; "Movement and Distribution of Water in the Soil"; "Electrocultural Experiments in Great Britain and France"; "Electric Farming in the United States"; "Electroculture of Growing Crops in Scotland"; "Influence of Crop, Season and Water on the Bacterial Activities of the Soil"; "The Cause and Prevention of Hairless Pigs"; "Cattle Lice and How to Eradicate Them"; "Nutritive Deficiencies of Wheat and Grain Mixtures and the Pathological Conditions Produced in Swine by their Use"; "The Role of Water in the Dairy Cow's Ration"; "The Breeds of Dairy Cattle in the United States"; "Trials of Agricultural Machinery" (a series of articles on competitive trials in different countries); "The Tractor in Relation to the Farm and its Machinery"; "Factors Governing the Design of a Small Agricultural Tractor"; "Mechanical Ploughing" (three articles on methods of ploughing, illustrated with diagrams); "Fire Prevention and Fire Fighting on the Farm"; "Cost of Keeping Farm Horses and Cost of Farm Labour in the United States"; "Study on the Cost of Market Milk Production in the United States"; "Influence of the City on Farming"; "Municipal Drying Plants for Fruits and Vegetables in the United States"; "Researches on Apple Spot Diseases"; "Settlement of Ex-Service Men within the British Empire after the War"; "Agricultural Reconstruction in the United Kingdom"; "A Statistical Inquiry into Agricultural Organization in the United States"; "Agricultural Co-operation in Scotland."

The Library.—During the year 1918-19, 1,574 bound volumes were added to the library making a total received of 6,322. An average of 750 unbound books and pamphlets was received every month (duplicates not being included). These have been classified by subject, and the resources of the library include the following:—

	Sections.		Sections.
Bibliography	2	United States D.A.	38
Sociology	137	" exper. stations	94
Including Statistics	39	Soils	7
Agricultural credit	3	Plants—Diseases and pests	6
Co-operation	6	Including—	
Science	27	Chemistry	2
Agriculture, general	6	Biology	2
Agricultural bulletins	12	Botany	5
" reports	22	Zoology	6
" societies	6	Veterinary medicine	10

	Sections.		Sections.
Periodicals	145	Live stock (not including herdbooks)	9
Reference books	12	Dairying	4
Crops	5	Bees	1
Fruit	5	Game	2
Horticulture	5	Home economics	5

(Other subjects are not included in the above.)

Catalogue cards received from the Library of Congress or typed in the Library bring the number of cards in the catalogue up to the total of 193,125. The Library of Congress cards (of which are received by subscription all referring to agriculture) are an important guide to agricultural literature and by following them, as well as the litreature referred to in the "International Review of the Science and Practice of Agriculture," "International Review of Agricultural Economics," "The Experiment Station Record," "The Agricultural Index," The Cumulative Book index," and the lists of government publications received from London, Washington, and our own Canadian lists, it is hoped to build up an agricultural library which will become more and more useful for research. As the Library has the catalogue of the U.S.D.A. Library, use might be made of it for loans from Washington. The Library of Congress cards do the work of an expert cataloguer. It would mean a great deal of work to do cataloguing which is done for us by them at the expenditure of a comparatively small sum.

Cards for 289 volumes purchased and located in other offices of this Department have been entered in the catalogue.

Periodicals which are indexed in the "Agricultural Index" are all available for consulation in the library. Besides these the aim is to have on hand all Canadian agricultural periodicals, all periodicals from foreign governments referring to agriculture, and some other important ones not included in those already referred to.

Special purchases during the year include the library of the former pathologist of the Health of Animals Branch. This consists of 205 volumes and a large number of pamphlets and periodicals and a catalogue of about 3,000 cards.

The library obtained by purchase a number of old publications of the U.S. Department of agriculture which were needed to complete files. Back issues of the following periodicals were also bought to make complete sets: Soil science, Phytopathology, Journal of Genetics, Journal of Agricultural Science, Journal of the American Society of Agronomy, Journal of Heredity, Journal of Economic Entomology.

A "want" list of U.S. Experiment Station publications was sent out in May 1918, with the result that a large number of bulletins was sent. The immediate response of the American officials was much appreciated. The thousands of duplicates received were offered to various officials of this department and the remainder were returned to the issuing stations.

Books and periodicals lent to persons, for use outside of the use made in the library, numbered 1,028.

THE PUBLICATIONS BRANCH.

As a feature of the policy of the Department of Agriculture to materially increase the production of crops and other farm products, a number of pamphlets have been prepared and distributed during the period of the war and more especially during the past fiscal year. The number of the larger bulletins and reports has consequently been reduced. The smaller publications, designated circulars, special circulars, pamphlets, crop protection leaflets, and leaflets, have covered practically the whole range of work necessary to be done on the farms, gardens, and orchards of Canada. These have been prepared by the officers of the different branches of the department specially qualified to deal with the respective subjects. It has been the duty of the Publications Branch to distribute these, as well as the more regular bulletins and reports, to the respective mailing lists and to such individuals as applied and to others who could best reach the producers of the various products of the soil. A keen demand was experienced for the gardening leaflets through the publication by the newspapers of press notices prepared and sent out by the Publications Branch. To each of the applicants, for these and all other publications not already on the mailing list, was sent an application card so designed that, when filled in and returned it became the guide to the staff in adding the names of the applicants to the subject lists desired. Following is a list of the publications distributed during the year:—

Reports—

- The Minister of Agriculture.
- The Agricultural Instruction Act.
- The Dominion Experimental Farms.
- The Veterinary Director General.
- The Proceedings of a Dominion Dairy Conference.
- The Canadian Record of Performance for Pure-Bred Dairy Cattle, Live Stock Branch.
- Fourteenth Annual Report Canadian Seed Growers' Association
- Five Monthly Fruit Crop Reports, Fruit Branch.

Bulletins—

- Apple Culture in Canada, No. 86, Experimental Farms.
- The Potato in Canada, No. 90, Experimental Farms.
- Poultry Feeds and Feeding, No. 91, Experimental Farms.
- Elevage du Lapin, No. 34, Experimental Farms.
- Peach Canker, No. 37, Experimental Farms.
- The Apple Bud-Moths and Their Control in Nova Scotia, No. 16, Entomological Branch.
- The Fruit Worms of the Apple in Nova Scotia, No. 17, Entomological Branch.
- List, Cheese Factories, Creameries, Skimming Stations, No. 54, Dairy Branch.
- Poultry Keeping in Town and Country, No. 89, Experimental Farms.
- The Diseases of Tomatoes, No. 35, Experimental Farms.
- l'Elevage du Mouton au Canada (New Edition), No. 12, Live Stock Branch.
- Agricultural Instruction in Canada.

Circulars—

Vegetable Gardening at Home and on Vacant Lots, No. 14, Experimental Farms.
Selection and Wintering of Biennial Vegetables for Seed, No. 15, Experimental Farms.
The White-marked Tussock Moth and Its Control, No. 11, Entomological Branch.
Keeping Dairy Herd Records, No. 25, Dairy and Cold Storage Branch.
The Best Varieties of Grain, No. 6, Experimental Farms.

Special Circulars—

The Self Feeder for Hogs, No. 15, Experimental Farms.
Labour Saving on the Farm, No. 16, Experimental Farms.
Ensilage in 1918, No. 17, Experimental Farms.
When Should Potatoes be Planted to Obtain Maximum Crops? No. 18, Experimental Farms.
Importance of Planting Good Seed Potatoes, No. 19, Experimental Farms.
Grow Flax for Fibre, No. 20, Experimental Farms.

Pamphlets—

Karakule Sheep and Persian Lamb Fur Production, No. 15, Live Stock Branch.
Fish Meal as a Live Stock Food, No. 17, Experimental Farms.
Recleaned Elevator Screenings (Standard Stock Food) as a Food for Live Stock, No. 18, Experimental Farms.
How to Make and Use Hotbeds and Cold Frames, No. 19, Experimental Farms.
Some Varieties of Tobacco Recommended for the Province of Quebec, No. 20, Experimental Farms.
The Construction and Care of Tobacco Seed Beds in the Province of Quebec, No. 21, Experimental Farms.
Cleaning Seed, No. S-1, Seed Branch.
Red Clover Seed and Its Impurities, No. S-2, Seed Branch.
Seed Importation Regulations, No. S-12, Seed Branch.

Crop Protection Leaflets—

Cutworms and their Control, No. 3, Entomological Branch.
Root Maggots and Their Control, No. 4, Entomological Branch.
Prevent White Grub Injury, No. 5, Entomological Branch.
How to Control Locusts or Grasshoppers, No. 6, Entomological Branch.
Rats and Mice, No. 7, Entomological Branch.
Aphids or Plant Lice, No. 8, Entomological Branch.
The Pea Weevil, No. 9, Entomological Branch.
Arsenate of Lime, No. 10, Entomological Branch.

Miscellaneous—

List of Publications Available for Distribution, Publications Branch.

Announcement of the Opening of the Winnipeg Seed Laboratory, Seed Branch.

Hangers and Circulars Respecting Bankers' Competition for Boys and Girls, Live Stock Branch.

Display Posters and Cards announcing availability of such new publications as were not distributed to the mailing lists, Publications Branch.

Leaflets S-3 to S-10 describing Noxious Weeds, and the several editions of Seasonable Hints, Seed Branch and Experimental Farms.

THE DISTRIBUTION.

During the year the Publications Branch distributed about 3,900,000 copies of publications. Of these 3,750,000 were distributed to the mailing lists and the remainder in response to requests.

The following table shows the number of copies distributed:—

	To the Mailing Lists.	On Request.
Reports	36,740	7,375
Bulletins	320,987	29,000
Seasonable hints	721,983	5,320
Pamphlets	558,801	68,260
Circulars	1,261,478	37,880
Leaflets	472,145	1,500
Announcement and application mailing list cards and posters	293,493	—
The Agricultural Gazette	60,369	3,672
	3,725,996	153,607

THE MAILING LISTS.

The mailing lists, which contain about 200,000 English and 51,000 French names, are divided into seven main subject lists and a number of minor lists. The main lists contain the names of persons who desire publications on field crops, live stock, dairying, poultry, gardening, bees, and tobacco. The names with addresses are embossed on metal stencils from which the entire lists, or any number of them, can be mechanically addressed without duplication. The lists are under constant revision. About 25,000 new names were added, 35,000 removed, and upwards of 7,500 addresses changed during the year. The minor lists include egg, produce and seed dealers, drovers, banks, school inspectors, agricultural officials and teachers, and others to whom is sent information from time to time.

The available publications of the department number upwards of two hundred titles.

THE AGRICULTURAL GAZETTE OF CANADA.

The Agricultural Gazette, which is constantly gaining recognition as a record of official agricultural activities and progress in Canada, continues to enjoy the editorial support of the officials of the provincial departments of agriculture and of education.

The policy during the year has been directed more and more to assist in standardizing throughout Canada the practices of government departments, more especially in administration, investigation, and instruction.

This journal, which has reached its sixth volume, contained during the year reviews of the recent federal and provincial legislation, announcements of new agricultural policy, accounts of the important departmental and association activities, especially in relation to co-operative enterprises, and such agricultural extension work as was carried on under the provisions of the Agricultural Instruction Act.

The whole respectfully submitted.

T. A. CRERAR,
Minister of Agriculture.

APPENDIX No. 1.

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

DATED 5TH DECEMBER, 1918.

IMPORTATION OF DOGS (AMENDMENT) ORDER OF 1918 (No. 2).

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1914, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:—

1. The period of detention and isolation prescribed by the Importation of Dogs Order of 1914 (hereinafter referred to as "the principal Order") is hereby increased to six calendar months, and the principal Order shall be read and have effect as if "six calendar months" were substituted for "four calendar months."

2. In the case of a dog landed after the thirtieth day of November, nineteen hundred and eighteen, under the authority of a license granted under the principal Order, the license shall have effect as if "six calendar months" were therein inserted instead of "four calendar months."

3. The Importation of Dogs (Amendment) Order of 1918 is hereby revoked.

4. This order may be cited as the Importation of Dogs (Amendment) Order of 1918 (No. 2) and shall be read with the principal Order.

In witness whereof the Board of Agriculture and Fisheries have hereunto set their Official Seal this fifth day of December, nineteen hundred and eighteen.

[L.S.] W. H. CHAMBERLAIN,

Authorized by the President.

REPORT

ON THE

AGRICULTURAL INSTRUCTION ACT

1918-1919

PRINTED BY ORDER OF PARLIAMENT

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1920

[No. 15a—1920.]

OTTAWA, September 30, 1919.

To the Hon. S. F. TOLMIE,
Minister of Agriculture,
Ottawa.

SIR,—I have the honour to present herewith the report on the Agricultural Instruction Act for the year 1918-19, dealing with the work carried on during the year by provincial departments of Agriculture and Education with the moneys assigned to them under the said Act.

I have the honour to be, sir,
Your obedient servant,

J. H. GRISDALE,
Deputy Minister and Acting Commissioner.

CONTENTS.

PAGE.

INTRODUCTION.. .. .. .

REPORT

ON THE

AGRICULTURAL INSTRUCTION ACT

FOR THE FISCAL YEAR 1918-19.

Tabled in pursuance of Section 8 of the above named Act.

INTRODUCTION.

The total grant for the fiscal year 1918-19, provided under the Agricultural Instruction Act to assist the provinces to carry on educational and instructional work for the benefit of agriculture, amounted to the sum of $1,100,000. The maximum had been attained in the previous year, and will there remain until the completion of the period contemplated by the Act in 1923.

According to the terms of the Act, agreements with the provinces were entered into which defined the purposes for which the grants for the year should be expended. The schedules allocating the moneys, as embodied in the several agreements, are given below.

The following is a summarized statement of the amounts actually expended during the year under the divisions of work to which the grant was applied:—

Agricultural colleges and schools	$282,851
Instruction and demonstration	621,450
Women's work	27,047
Elementary agricultural education (including school fairs in part)	163,647
Boys' and girls' clubs	15,556
Veterinary colleges (including special vote in Quebec agreement)	25,000

While the above constitute the main divisions under which the grant was expended, a summary of this kind is, necessarily, somewhat arbitrary. Because of the differences of procedure in different provinces, the fields of work, and consequently the allotments, are inter-related in various ways. Particularly between the divisions "Agricultural Colleges and Schools" and "Instruction and Demonstration" is it difficult to make a clear distinction. For example, the sum set aside for "Agricultural Colleges and Schools" is not expended in all cases for the exclusive benefit of those institutions, but has a far more extended application. Thus it will be found that the contribution to those institutions is used not only in strengthening the staffs of teachers and to meet the cost of research work and special investigations into agricultural affairs, it is also used in some instances to provide additional building accommodation and equipment, or to establish schools of agriculture, such as that at Kemptville, Ont.; to aid the agricultural schools in Alberta, and to carry on special courses and extension work generally, both among children and adults. From this it will be realized that a part of the allotment is used in promoting work of an instructional and demonstrational character, usually referred to as college extension, so that part of the allotment belongs, strictly speaking, to the "Instruction and Demonstration" division of the grant.

The colleges and schools benefiting from the grant are the Ontario Agricultural College, Guelph; the Agricultural School at Kemptville, Ont.; the Macdonald College,

and the schools of Agriculture at Oka and Ste. Anne de la Pocatière in the province of Quebec; the College of Agriculture of the University of Saskatchewan; the Agricultural schools at Claresholm, Olds and Vermilion in the province of Alberta and the College of Agriculture in the province of British Columbia.

The allotment for "Instruction and Demonstration" bears either the whole or a large proportion of the cost of maintaining the agricultural representatives and their offices. These are the local resident agents of the provincial agricultural departments, and usually their work is related to most of the departmental activities which are not administrative in character. Among the customary activities of these officers may be included short courses, boys' and girls' clubs, school fairs, and many other undertakings. In addition, the instruction and demonstration item includes special propaganda, undertaken by agricultural departments, for the promotion of better farming, demonstrations in fruit-growing, poultry and bee-keeping, co-operative marketing, field husbandry, dairying and live stock.

"Women's Work", which includes household science, hygiene, home-making, dressmaking, and home nursing, is assisted in the majority of the provinces through the women's institutes or equivalent organizations. Besides the supervision of these organizations, lecturers and demonstrators attend gatherings of women from rural communities and spread among them a knowledge of better methods for the conduct of household affairs, work that might also come in a broad sense under the general classification of "Instruction and Demonstration."

The allotment to "Elementary Agricultural Education" is employed in various ways to extend agricultural teaching in the rural schools. It also assists in the very necessary function of enabling teachers to qualify for giving such forms of instruction, in remunerating teachers for this class of work and in providing equipment and supplies incidental to it. It is employed in connection with the school and home garden and the school fair movement, and in some instances promotes the teaching of agriculture and household science, including cooking and sewing, in high schools, collegiate institutes and similar institutions, from whence the supply of teachers is drawn for the rural community.

The allotment to veterinary colleges is for the purpose of assisting institutions qualifying young men for the veterinary profession. Two such institutions participate, the Ontario Veterinary College, and the School of Veterinary Science at Montreal.

The above will serve to indicate briefly the wide range of work by means of which the Agricultural Instruction Act assists in promoting the welfare of that portion of the community which is associated with the country's greatest basic industry—agriculture. A more comprehensive review of the work for the year will be found in the main body of the report.

ALLOCATION OF AGRICULTURAL INSTRUCTION GRANT OF 1918-19.

The grants made to the provinces by the Government of Canada under the Agricultural Instruction Act for the fiscal year 1918-19 are herewith given:—

Province.	Amount.
Ontario	$ 336,303 26
Quebec	271,113 76
Nova Scotia	81,116 69
New Brunswick	64,110 80
Prince Edward Island	31,749 22
British Columbia	69,199 06
Manitoba	77,113 11
Saskatchewan	81,728 48
Alberta	66,965 62
Veterinary colleges	20,000 00
Total	$1,100,000 00

SESSIONAL PAPER No. 15a

ONTARIO

Agricultural Colleges and Schools.

Ontario Agricultural College—		
(*a*) Buildings, equipment and furnishings (re grant—payment deferred)	$135,000	
(*b*) Salaries and expenses, additions to staff, maintenance	15,000	
		$150,000 00
Agricultural School and Farm—		
(*a*) Capital expenditure (payment of $40,000 deferred)	$ 60,000	
(*b*) Maintenance, purchase of stock, machinery, repairs, services, expenses and equipment	20,000	
		80,000 00

Instruction and Demonstrations.

Agricultural representatives, including clerical and other assistance in connection with the administration	20,000 00
Extension work in household science in rural communities	1,500 00
Co-operation and markets, educational work in connection with the marketing of farm products, including organization of co-operative societies	7,000 00
Demonstration and instruction in vegetable growing	7,500 00
Stock and seed judging short courses and institute lectures	692 97
Women's institute work, including courses in cooking, sewing, etc.	5,000 00
O.A.C. short courses for winners of acre—profit and live stock competitions, including travelling and living expenses	2,900 00
Lectures in horticulture	500 00
Demonstration in growing and handling fruit	2,000 00
Demonstration with vegetables and hardy fruits in New Ontario	4,500 00
Vineland Horticultural Experiment Station experimental work	2,000 00
Drainage work	2,500 00
Demonstration work on soils	3,500 00
Beekeeping	500 00
Instruction and special educational work in growing and hauling corn	3,500 00
Instruction and demonstration with live stock and poultry	2,000 00

Elementary Agricultural Education.

To provide for and to encourage the teaching of agriculture, manual training as applied to work on the farm, and domestic science in high, public, separate and continuation schools, and in universities, to be available for grants, services, expenses and equipment, and travelling and living expenses of teachers, inspectors and others in attendance at short courses, or other educational gatherings, and to be paid out on the recommendation of the Department of Education	40,000 00
Total	$336,303 26

QUEBEC.

Colleges and Schools of Agriculture.

Grants and allowances—	
Macdonald College, School of Agriculture, Ste. Anne de la Pocatière, Oka Institute	$75,000 00
School of Veterinary Science—building extension	5,000 00

Instruction and Demonstration.

Animal husbandry	9,000 00
Poultry husbandry	18,000 00
Horticulture and entomological work	31,000 00
Experimental and demonstration orchards	4,000 00
Dairying—educational work in cheese and butter-making	5,000 00
Agricultural representatives	67,000 00
Seed selection, clover plots and demonstrations	9,000 00

QUEBEC—*Continued.*

INSTRUCTION AND DEMONSTRATION—*Continued.*

Bee-keeping—educational work	7,000 00
Drainage	6,900 00
Maple industry—maintenance of schools and allowances to students	4,000 00
Short courses and lectures	9,113 76
Experimental union	2,000 00

ELEMENTARY AGRICULTURAL EDUCATION.

To promote the teaching of agriculture in academies, rural and normal schools, teacher training, school gardens	8,000 00
To promote the teaching of domestic science in academies and normal schools—grants, lectures and inspection	10,000 00
School children's exhibits	2,000 00
Total	$271,113 76

MANITOBA.

Demonstration farm, Killarney	$ 4,000 00
Dairy work	6,000 00
Poultry	5,000 00
Agricultural representatives	8,113 11
Boys' and girls' clubs	19,000 00
Short courses in agriculture	16,000 00
Home economics, including short courses in household science	15,000 00
Soil analysis and survey	1,000 00
Bee-keeping	2,000 00
Miscellaneous	1,000 00
Total	$77,113 11

SASKATCHEWAN.

COLLEGE OF AGRICULTURE.

Staff salaries—research and extension service	$21,476 16
Women's work—homemakers' clubs	5,500 00

INSTRUCTION AND DEMONSTRATION.

Co-operation and marketing	6,900 00
Animal husbandry	6,000 00
Dairying	6,000 00
Field husbandry	6,000 00
Demonstration trains	1,000 00
Agricultural representatives	1,476 16
Veterinary short course	500 00

ELEMENTARY AGRICULTURAL EDUCATION.

Agricultural instruction in public, high and normal schools; household science; training of teachers; nature study	25,000 00
School fairs	1,976 16

POST GRADUATE COURSE IN AGRICULTURE.

Agricultural scholarships	800 00
Total	$81,728 48

ALBERTA.

Schools of Agriculture.

(*a*) Maintenance	$35,000	
(*b*) Equipment, including libraries	3,500	
		$38,500 00
Demonstration farms—maintenance		8,000 00
Publicity		2,500 00
Women's work		7,500 00
Agricultural representatives		10,000 00
Miscellaneous		465 62
Total		$66,965 62

BRITISH COLUMBIA.

Agricultural and horticultural instructors and agricultural representatives	$10,000 00
Field crop and dry farming demonstration stations	3,100 00
Seed work	1,000 00
Field crop competitions	2,000 00
Silo demonstrations	3,000 00
Drainage demonstrations	500 00
Horticultural demonstrations and competitions	3,000 00
Fruit packing and pruning schools	2,000 00
Poultry	1,000 00
Dairying	3,000 00
Bee-keeping	2,500 00
Boys' and girls' clubs	1,500 00
Agricultural Journal and publications branch	5,000 00
Pathological and entomological investigation and research	3,000 00
Miscellaneous	599 06
Agricultural instruction in public, high and normal schools, training of teachers, grants	20,000 00
University of British Columbia—Investigation and extension	8,000 00
Total	$69,199 06

NOVA SCOTIA.

College of Agriculture

Science building—interest and sinking fund	$ 8,000 00
Salaries and maintenance	23,000 00

Demonstration and Instruction.

Agricultural representatives	12,500 00
Short courses, including maintenance of demonstration buildings and allowance to students	1,000 00
Dairying	4,500 00
Poultry	1,500 00
Bee-keeping—educational work	300 00
Drainage demonstration and soil surveys	1,800 00
Soil and fertilizer demonstrations	1,700 00
Field-crop demonstrations	1,500 00
Fruit-growing	2,000 00
Women's work—institutes and clubs, domestic science short courses, and allowances	2,000 00
Entomological work—investigation and education *re* insect pests	9,000 00

Elementary Agricultural Education.

Agricultural instruction in public, high and normal schools, teacher training, grants and allowances	10,000 00
School children's exhibits and competitions	2,000 00
Contingencies and miscellaneous	916 69
Total	$81,716 69

NEW BRUNSWICK.

AGRICULTURAL SCHOOLS.

Equipment	$ 500 00
Salaries and maintenance	2,400 00

INSTRUCTION AND DEMONSTRATION.

Agricultural representatives	8,860 00
Bee-keeping	2,700 00
Soils and drainage	3,700 00
Horticulture	6,000 00
Live stock	6,300 00
Dairying	4,600 00
Poultry	4,300 00
Fertilizers	500 00
Entomology	1,300 00
Agricultural societies	1,600 00
Women's institutes	6,000 00
Miscellaneous	550 80

ELEMENTARY AGRICULTURAL EDUCATION.

Agricultural instruction in public, high, and normal schools, household science, teacher training, grants and allowances.	13,000 00
School fairs	1,800 00
Total	$64,110 80

PRINCE EDWARD ISLAND.

Equipment and maintenance, agricultural halls	$ 2,825 00
Director and agricultural representatives	5,500 00
Short courses	300 00
Drainage and soils	1,000 00
Live stock and dairying	2,900 00
Poultry, beekeeping, horticulture and co-operative marketing	300 00
Women's institutes	3,510 00
Agricultural instruction in public and high schools, training of teachers, allowances, grants, maintenance of rural science department, Prince of Wales College	11,500 00
Contingencies, including clerical assistance	3,914 22
Total	$31,749 22

THE EMPLOYMENT OF THE GRANT FOR THE PAYMENT OF PRIZES.

The question of permitting the use of Agricultural Instruction funds for the payment of prizes for boys' and girls' clubs and school fairs came up for consideration during the year. The regulation as to prizes, framed at the time the Agricultural Instruction Act came into effect, precludes the payment of prizes and premiums in excess of 10 per cent of the amount allotted to any specific activity. It further provides that the money expended on prizes, besides being limited to 10 per cent, shall be used in such a manner as to promote further instruction along the line of the demonstration. The regulation applies to boys' and girls' work in common with all other competitions. In the case of school fairs, in particular, where the individual prizes are very small the regulation is not easy to apply, and the question arises as to whether some relaxation should not be permitted.

Careful consideration of the matter leads to the conclusion that a rigid application of the regulation insofar as it relates to boys' and girls' clubs and school fair work is not at present advisable. At the same time a too free use of government funds from whatever source derived for prizes of this class, is not desirable. Every effort should be made to secure local contributions. Other resources should not be drawn

upon unless these prove to be insufficient. The principle laid down in the regulation that prize money should be applied in such a way as to provide additional instruction is a sound one, and it is desirable that an effort should be made to apply it.

AGRICULTURAL EDUCATION.

Employment of the Agricultural Instruction Grant to assist School Agriculture.

The manner in which the grant is applied for the promotion of elementary agricultural education by the departments of education of the respective provinces will be found specifically set forth in the *Agricultural Gazette* for 1919. The procedure followed by the province of Saskatchewan is somewhat different from that of other provinces and is worthy of special note. Not long after the moneys provided by the Act became available for the purpose of assisting agricultural teaching in the schools, Saskatchewan appointed an advisory committee, composed of the leading agricultural and educational officials, to advise the Minister of Education as to the steps to be taken for the encouragement of this phase of education. The decision to appoint a joint advisory committee to deal not only with actual school work but also with what is known as the junior extension movement, was the outcome of the recognition of the desirability of complete accord between the two departments, with resulting co-ordination of work, and the avoidance of pitfalls in the way of the practical application of instructional methods. It was realized that in a number of the states of the Union, as well as in some of the provinces of Canada, a great deal of experimental work had been carried on in elementary agriculture, and that many schemes of agricultural education had been abandoned after considerable outlay had been made upon them. The combined supervision of the officers of both departments would, it was believed, tend to the development of a sound and successful policy.

The personnel of the committee formed to deal with the matter was such that all the forms of work relating to agricultural education in elementary and secondary schools, junior extension, school fairs and similar activities could be made known to the committee as a whole and discussed. By this means the knowledge and experience of the Department of Agriculture and the College of Agriculture were made available to the Department of Education. Consequently, the policies recommended were seldom of an experimental nature, but had in them from the beginning the prospect of a reasonable outcome.

As a result, a large measure of success has attended the movement in connection with elementary agricultural education in Saskatchewan. The deliberations of the Agricultural Instruction Committee have led to a proper definition of junior extension work, whether carried on by the College of Agriculture, the Department of Agriculture or the Department of Education. Overlapping has been avoided, and efficiency and economy have been attained.

In view of the facts, the desirability is suggested of a closer co-operation between departments of education and agriculture in provinces where such co-operation does not already exist. Observation leads to the inference that at the present time a certain amount of overlapping effort is discernible in some instances between the respective departments which perhaps might be avoided in this way. There are also indications at times of what is perhaps a very natural difference in the point of view of departments of education and agriculture in regard to the values to be attributed to different forms of instruction. It seems probable that the vocational aspects of the work are prominent in the minds of agricultural officials, whereas cultural values are emphasized by educationalists. It should be recognized, however, that the chief value of school agriculture and related projects lies in the opportunity presented for training the intelligence through facts vital to country rather than to city life, and that, there-

fore, all junior extension movements should be regarded as instruments in the accomplishment of this object. In addition to this, it is evident that the subject of school agriculture is of such a nature that its practical application is often an essential requirement to successful teaching, for the reason that theoretical instruction fails to arouse vivid interest in the mind of the pupil. Because of this fact a demand has arisen, based on teaching experience, for a form of instruction which shall vitalize the work, such as the school garden. Still wider opportunities for combining theory and practice are presented by the school fair, the poultry or potato project and boys' and girls' club contests. In several of the provinces much excellent work is being done by agricultural officials through such organizations as boys' and girls' clubs. These activities do much to awaken in the minds of the young people who engage in them an appreciation of the possibilities of agriculture, and to stimulate a greater enthusiasm for agriculture as a vocation.

At times, in fact very frequently, a lack of enthusiasm for agricultural teaching is observable. This is evident, not only on the part of the teaching fraternity, but also on the part of those entrusted with the local direction and management of educational affairs. Too often indifference and sometimes antagonism on the part of the local authorities to agricultural teaching is manifest. Departments of Education generally are making provision for the more or less systematic training of teachers in agriculture, recognizing that an adequate force of properly equipped inspectors and teachers is one of the essentials to advancement in this regard. This is perhaps best provided for by making agriculture a continuation subject in high and normal school courses, and quite frequently the grant assists to this end.

The compulsory teaching of agriculture is not by any means general. When not compulsory, it is not incorporated in the system of instruction, but remains optional, and the pupil is given credit for it neither in regular work nor in examinations. But even where it is optional, the fact remains that the local authorities have it in their power to require the teaching of agriculture in schools under their control, and can command teachers reasonably qualified for the work. Unfortunately, in communities where trustees remain indifferent or antagonistic, it is not likely that a very rapid advance will be made.

In two provinces, namely in Alberta and in Ontario, three local agricultural schools have been established with the assistance of the grant. These schools are entirely under the jurisdiction of the respective departments of agriculture, and are not associated with the provincial school system in anyway. Their function is to supply facilities for obtaining locally a vocational education in agriculture, instead of depending entirely on a provincial college of agriculture. The limitation attending the courses of instruction offered by these schools is that they lead only to the farm. Consequently, the student must elect to follow farming as a vocation or otherwise the value of the course will, to a great extent, be lost. This may deter undecided ones from attending these schools, but it is anticipated that a limited number of schools of this kind will draw sufficient students to make them successful. Alberta has now had several years' experience in its localized farm school policy, and that the results have been generally satisfactory will readily be admitted. In Ontario the school at Kemptville is still in process of construction, building operations having been delayed by the war.

TRAINING SCHOOL GIRLS FOR DOMESTIC PROFICIENCY.

The framers of the Agricultural Instruction Act had a further object than the development of proficiency in the calling of agriculture. Better crops, better live stock and greater prosperity for the rural community were but incidental to the achievements looked for from the work to be accomplished. The development of a rural

citizenship was the ultimate aim. Its accomplishment depends not only on a better knowledge of farm methods insofar as the activities of men are concerned, but on a womanhood better equipped for the efficient management of the home. In apportioning the grants each year, both aspects of the needs of the rural population have been kept in mind.

Until federal assistance was offered for rural education, household science instruction was considered quite outside the range of the country school. In its introduction, in a tentative way, one of the western provinces may claim to have taken the lead, but other provinces are now working out plans for giving elementary instruction in the rural schools on this very important practical subject.

Commendable progress is being made by Ontario in developing household science instruction in the rural school. The difficulties that have hindred progress in this direction, such as limited accommodation and resources, have to a great extent been overcome. Substantial grants are now offered to assist school boards to purchase equipment. Equipments have been designed that take up but little space in the one-room school, and the Ontario Education Department has issued an excellent household science handbook.

The household science work of the Department of Education of Saskatchewan is in charge of a director and six assistants whose work is financed from the grant. Two of the assistants teach in the two normal schools. The remaining four carry on extension work in the rural and village schools. These household science teachers accompany the inspectors on visits to the schools where they discuss the work with teachers, trustees and parents. Their duties are summarized as follows:—

1. Establishing noon lunch.
2. Teaching type lessons in sewing and in sanitation, and helping teacher to arrange programme of work.
3. Attending public meetings of school board and rate-payers for the purpose of giving information regarding the installing of equipment and operating the noon lunch.
4. Visiting the homes, with a view to bringing the home and school in closer touch.
5. Attending school fairs and teachers' conventions.
6. Giving the necessary instruction in the normal classes held for third-class teachers.
7. Assisting in instruction at the summer session.
8. Assisting in such other related work for the department as is deemed advisable.
9. Conducting short courses in various parts of the province during the winter months.

Care is taken to impress upon teachers and parents that although the noon lunch is very important, it is but one phase of household science work in rural schools. The great need of the prairie school demands attention to this reform first.

Up to the present time the Department of Education has given no special grant towards the cost of installing household science equipment in the rural schools, preferring to expend its funds in propaganda work believing that parents are willing to promote the best interests of their children when they realize what those interests are.

In the province of Manitoba instruction in household science is provided by the girls' club work conducted by the extension division of the Department of Agriculture in co-operation with the educational authorities.

In Alberta the need for household science instruction for girls from the farm is being met through the special agricultural schools established by the Department of Agriculture with the assistance of the grant. With their further extension, it is anticipated that instruction of this character will be available over a wide area of the province.

In Quebec, household and academic science is taught in many of the convent schools. Fifty-one of these institutions, under the management of nuns of various orders, receive from the Provincial Department of Agriculture, from funds provided under the Agricultural Instruction Act, a yearly grant, provided that such institutions give a domestic science course officially recognized as of good efficiency, and that they make a full report of their work three times a year to the department.

So far as the English-speaking community is concerned, the work is largely in the hands of the household science department of Macdonald College. The college demonstrators give instruction to the children in canning, bread-making and sewing, while teachers are instructed in the preparation of the hot lunch. The members of the Quebec homemakers' clubs have also given valuable assistance in improving the lunch hour and in introducing household science in the schools. During the year, members of the college staff held fifty demonstrations for school children, attended by over 2,000 pupils and parents. The audiences were made up chiefly of girls going to school, but in many cases older sisters and mothers attended. The policy adopted of gathering the pupils of several schools together at some convenient centre has given good results. Nova Scotia has adopted the system of employing travelling rural science teachers. Seven of these are employed, each one being held responsible for the agricultural and home-making subjects in about a dozen schools. As the work has only recently been inaugurated, the actual results are small as yet, but those controlling it look forward with confidence to its extension.

In Prince Edward Island, a well equipped domestic-science kitchen has been provided at Charlottetown, which is used for short courses for country girls during the winter months and part of the term for classes from the city schools.

THE JUNIOR EXTENSION MOVEMENT.

In the general term junior extension work may be included all forms of boys' and girls' club work as well as acre-profit and similar competitions not organized as clubs.

In its most approved and valuable form the club idea should be developed either as an integral part of the school system or in very close alliance with it. As the logical outcome of nature study and elementary agriculture it may well find a place in the educational system as it affords a chance to teach agriculture through local application. For the best results, adequate supervision and follow-up work are absolutely necessary. Ontario affords an excellent example of the follow-up in the short course provided at the agricultural college for the competition winners from each county.

The real reason for the development of the club idea is to teach agriculture. This must be kept constantly in view. The prize-winning and other material aspects of these contests should not be emphasized unduly, although they assist without a doubt in attaining the end desired as the element of competition and of financial profit lend interest and zest to the undertaking.

Through the work of the clubs, elementary agriculture takes on a more real and a more vital aspect. More than that, it tends to bridge the gap between school and home life and is in fact the only form of effort that has hitherto succeeded in accomplishing this much desired result. The subjects taught in the school are seen to bear a direct relationship to the common things of life. The school is thus linked up with the life of the community in a vital way.

It is not surprising, therefore, that the movement is attracting very widespread interest, and that in some provinces a considerable portion of the federal grant is being expended for teaching of this practical type among the young people of the rural districts. Notably in the province of Manitoba and other prairie provinces, agricultural college authorities, school authorities, women's organizations, business men and public

spirited citizens are beginning to recognize in the movement a new and promising idea, and are working together for its promotion. Thus we find bankers willing to do the financing of a club project, accepting a promise to pay on the part of the boy making the loan as sole security. The business training and the contact with business men brought about in this way cannot fail to lead to a fuller comprehension of business affairs, on the part of the young people engaging in these activities.

The value of the work of the club members will easily be realized. No boy or girl can carry on a club project lasting for several months and faithfully carry out all that pertains to it without having interest stimulated in a high degree. He or she cannot plough and prepare the soil, or care for the poultry or pigs, or make a garment, or bake a loaf of bread, go through the process of canning fruit and vegetables, or select seeds and fertilizers, combat insects and diseases, or clean up the back yard prior to gardening operations, without coming in contact with scientific facts, whether they recognize them as such or not, and having lasting impressions made upon them; without learning to take bravely discouragements due to climate or other causes; without recognizing the need of co-operative relationships; without learning to respect the rights of others; and without learning lessons in community work. They will be spurred on by the competitive spirit, will be more keen and observant, and will find expression of their thoughts in the final report which they must render.

Boys and girls learn to work, to observe, to discriminate, to co-operate, to describe what they do; they learn business methods, they learn to weigh and balance things according to real values; they are encouraged to read and discuss, they are broadened by their contact with others, they develop initiative and judgment, they come to the age of eighteen or nineteen able to do something with a knowledge of how and the confidence that they can do it. Club work gets hold of boys and girls at the right stage of their development for directing or redirecting their thought.

ONTARIO.

During the year 1918, 307 fairs were held in the Province of Ontario, and 2,868 schools were included in the movement, with a total of 71,086 children taking part. This is an average of 9 schools for each fair and 25 pupils for each school. It is estimated 84,338 children and 88,908 adults attended the fairs, making a total of 173,246. The pupils had 66,613 home plots and made entries to the number of 115,531.

The provincial Department of Agriculture has been careful to purchase for distribution to the school children none but the best quality of seed oats, barley, wheat, and potatoes that could be obtained. Many farmers thus get a start with seed of the highest quality and of the best varieties. Agricultural representatives have been shown whole fields of grain and potatoes which had as their origin the small package of seed distributed to the pupils of the schools during the past few years. The value, therefore, of the school-fair work in the distribution of pure seed through the country must be recognized.

The number of eggs distributed of a bred-to-lay strain of utility breeds of poultry numbered 10,000, the greater quantity coming from the poultry breeding stations established by agricultural representatives in the different counties of the province.

The school fairs are managed by a rural school fair association composed of representatives from each school with the agricultural representative as manager.

District Fairs.

During the past season there were four district school fairs held in the province, where the winners at the smaller fairs were brought together. These were held in the counties of Oxford and Wentworth and the districts of Algoma and Manitoulin Island.

Generally speaking prizes were offered by the agricultural society where the fair was held in the central part of the county or district. The 1st, 2nd and 3rd prize exhibits from the different school fairs in the county competed at the district fair.

Junior Farmers' Competitions.

During the past few years the agricultural representatives of the Ontario Department of Agriculture have conducted profit competitions in feeding hogs, field crops, producing milk and feeding calves. These competitions were open to young men, farmer's sons, under thirty years of age, the prize being a free two-weeks' course in stock and seed judging, poultry raising, horticulture, farm dairying, bee-keeping or farm power conducted at the Ontario Agricultural College. All the competitions started off in the spring of the year, under fairly favourable circumstances, but owing to war and labour conditions a number of the contestants were forced to drop out before the competitions were concluded.

QUEBEC.

The school and home gardens, boys' and girls' clubs and school fairs are under the direction of a special officer of the Department of Agriculture, assisted by the agricultural representatives and other members of the departmental staff. The department supplies pupils with seeds, plants and eggs. Some seventy-nine school exhibitions were held during the year.

Junior Extension work among the English-speaking population is carried on by the Rural School and Household Science sections of Macdonald College. In 1918 the number of fairs increased from twenty-one to thirty (including seven for French schools). Seeds or eggs were distributed to 7,800 children, compared with 4,900 in the year previous. Lecturing and judging also form part of the work. It is the intention that in future Macdonald College shall deal exclusively with the English fairs while the Department of Agriculture, through its demonstrators, will assume direct control of fairs in the French communities.

The Household Science Department of Macdonald College deserves credit for the uniformity introduced in connection with the cooking, canning and sewing competitions. This has been accomplished by the adoption of uniform age limits and having each pupil make the same kind of exhibit in each particular limit, together with a wide distribution of patterns, directions and bulletins. During the year, 105 demonstations were given in the schools by members of the staff.

MANITOBA.

The year 1918 was regarded as the banner year in Manitoba for the boys' and girls' clubs. In the spring the goal was set at 20,000 members, but the interest in the movement by the club leaders and the juveniles themselves was so great that over 25,000 were enrolled. Twelve contests were included in order that every member might find something in which he was interested. The contests were: Pig, calf and poultry rearing, grain growing, gardening, garment making, cooking, canning, wood-working, weed eradication, dairying, and essay writing. On account of the need for food supplies, the food production contests were emphasized, and the results were of a most gratifying nature. Pigs from six to eight weeks old to the number of four hundred and eighty were secured and distributed among club members at cost. The Winnipeg Rotary Club loaned $350 to club members living at places where there were no banks, and the entire amount with interest was returned to the Rotary Club by the club members on the day it was due. Owing to the scarcity of help, it was not possible for nearly all the pigs to be shown. However, reports received from club members show that over 3,000 pigs were reared, or very close to half a million pounds valued at $80,000.

In the spring, 40,000 eggs were supplied to club members, mostly in the newer districts. The eggs were purchased from farmers living in the province who kept good flocks. A charge of forty cents a dozen was made to help pay the express, etc. The balance of the purchase price, sixty cents a dozen, was taken care of by the department. As good flocks of chickens can now be found in every part of Manitoba, it will not be necessary to supply eggs at reduced rates in succeeding years.

In registered seed growing there were 606 members enrolled. The exhibits of sewing and cookery showed great improvement while the number of exhibits of canned vegetables increased over 1,000 per cent, thus showing that the boys and girls were alive to the needs of the nation in food conservation.

The plan of organization was very similar to that of previous years. The inspectoral division was taken as the unit and the inspector as the natural club leader in his division. Plans for the year's work were fully discussed at a meeting of the inspectors and representatives from the extension service, and a programme for the year outlined. This arrangement resulted in close co-operation between the Department of Agriculture and Education, and explains more fully than anything else the increase in membership. The natural marketing centre of a district was taken as the logical headquarters for a club, and the town and the surrounding rural schools joined together in making the club work a success.

Most of the successful clubs were fortunate in having as the club manager some public spirited citizen, as a banker, a clergyman, storekeeper, farmer or school trustee. Teachers also make good club leaders, but on account of many teachers changing during the summer vacation, it has been found very desirable that a permanent resident have charge of the club, and it is very rarely indeed that he does not receive the wholehearted support of the teacher.

For the most part, club members furnished their own seeds and other supplies. In getting money for the club fair prize list, the school boards have been liberal, and usually have set apart a grant of $5 or $10 for each rural school or for each room in the graded school. In addition to this, the Department of Agriculture provided from provincial funds one-third of the money paid in cash prizes in the agricultural and home economics sections.

The outlook for efficient agricultural teaching in the public schools of Manitoba is very bright. Officially, perhaps it might be said that agriculture is not taught in the schools, but, practically, it must be said that a great deal of it is taught, and taught in the very natural way. A close observation of the situation in Manitoba indicates that teachers devote more time to the teaching of agriculture than is usually the case, and, further, that they have secured the co-operation of the parents. In other words, the organizing ability of the teacher is combined with the sound practical knowledge and experience of the parents in directing the pupils along the most natural lines in the study of practical agriculture. The boy or girl who has been enabled to put $50 or $60 in the bank in his or her own name, as the result of work and study in conducting one of these agricultural projects, need not be asked if he or she enjoys studying agriculture because fully half the competitors in pig rearing in the province were girls, who were thereby developed in resourcefulness, self-reliance and confidence.

The number of exhibits at the fairs was as follows: Pigs, 1,123 pairs; calves, 895; chickens, 3,950; grain, 644; vegetables, 11,849; cookery, 5,263; sewing, 7,309; canning, 3,131; weeds, 962; dairying, 799; woodwork, 1,120; schoolwork, 18,377; other work, 990. A much larger number took part in the competitions, but for various reasons many exhibits did not reach the fairs.

Agricultural Woodworking Courses.

During July and August there was a very insistent demand for ten-day short courses in woodworking by the senior members of the boys' and girls' clubs. During

these months it is possible to secure the services of expert teachers from the Brandon and Winnipeg schools, and those who were in attendance seemed to enjoy the work even more than play, and a great deal of exceptionally good work was turned out. Local school boards provided the material needed. The average attendance was 22, and the aggregate attendance 4,230.

SASKATCHEWAN.

An interesting development in the province of Saskatchewan has been the organization of rural education associations. These associations, now numbering 80, were organized to arouse public interest in education in its relation to rural life, and in agricultural education in particular; to promote the use of the school garden; to encourage home-garden projects; to promote school exhibitions; to foster boys' and girls' clubs and similar activities. The association movement has developed so rapidly as to require a director, and in 1918, Mr. F. W. Bates, who had acted as director of school agriculture in the northern half of the province, was appointed to take charge of association work. About 2,000 schools participated in school exhibitions in 1918. Well-balanced programmes were arranged in most places. The exhibits were largely school-garden products and class-room work. In many cases stock entered in the Canadian Bankers' Association competition, or other local stock or poultry competitions and club work were most interesting features.

ALBERTA.

The school fair work made some progress in Alberta last year, although it did not reach great magnitude. The agricultural representatives of the department who have the school fair work in hand, were pressed into service in behalf of greater production, and the school fair work was not very greatly forwarded. The movement is growing rapidly, however, on its own merits. The growth is shown by the following table:—

	Number of Fairs.	Schools.
1916	6	85
1917	9	157
1918	15	241

More livestock features are being included than formerly. Besides the calves, colts and chickens previously included in the prize list, the work of pig clubs is made to culminate in the school fair, though the pig clubs are rather differently organized and financed.

Details as to the volume of work and extent of interest connected with the fairs may be gathered from the following figures: There were 1,591 exhibitors, 7,737 exhibits, and 11,000 people in attendance at the fairs.

NOVA SCOTIA.

In 1918, there were 57 school fairs held, at which 231 schools exhibited. Individual fairs were held by 28 schools, and the remaining 208 schools at 29 different centres, covering 4 to 30 schools. This compares favourably with 130 schools exhibiting in 1917. Demonstrations in milk testing were carried out by the teachers at a number of fairs, to prepare for which fifteen teachers took a special course in milk testing at the summer school at Truro.

Poultry-project work in Nova Scotia schools is under the direction of the poultry superintendent who is an officer of the Department of Agriculture. Boys' and girls' clubs have not been organized.

NEW BRUNSWICK.

There were 21 school fairs held in 1918 in which 50 schools participated. In 1917, 14 fairs were held. In New Brunswick it is not unusual to hold single school fairs, but union among districts for school-fair work has been effected to a greater extent than ever before.

In addition to the poultry clubs for boys and girls organized by the poultry superintendent of the Department of Agriculture, there were 73 poultry clubs organized as home projects in the schools of the province under the control and instruction of the teachers. Instruction was given to all the pupils in the schools where clubs were organized whether they were enrolled in the clubs or not.

PRINCE EDWARD ISLAND.

During the year 1918, school fairs registered a marked advance so far as numbers and educational value were concerned. Much enthusiasm was apparent among parents, teachers and pupils as regards the benefits derived from them. For this class of work the schools are grouped in what are called "school fair centres." There were 29 school fairs held in 1918, in which between 160 and 170, or over a third of the schools, were represented.

All the club work done in the province is carried on in connection with the schools. The clubs are organized in connection with the school fair centres. The educational aspects of the work are emphasized, members being required to keep records of their work, write compositions upon it and to exhibit at the school fairs.

AGRICULTURAL COLLEGES AND SCHOOLS.

ONTARIO.

The sum of $135,000 has been set aside to complete the programme of building contemplated at the Ontario Agricultural College with Agricultural Instruction funds. This programme was held in abeyance during the war, and the payment of the money deferred until actually required.

The contribution to staff salaries amounted to $15,000, and provided for the following: A director of farm surveys; lectures in poultry husbandry, horticulture, and geology and chemistry; an assistant in plant-breeding, three demonstrators in chemistry; demonstrators in botany, entomology, horticulture, and drainage; a lecturer and assistant in physics and three demonstrators in drainage.

The Kemptville Agricultural School and Farm.

The Ontario Department of Agriculture some two and a half years ago acquired land at Kemptville, in Eastern Ontario, for the establishment of a school of agriculture with demonstration farm in connection therewith. This school is being established and will be carried on by the provincial Department of Agriculture with funds provided from the Federal grant for Agricultural Instruction. The first of the school buildings, the live stock judging pavilion, was completed by the end of 1918, and provided accommodation for the six weeks of short courses in general agriculture, farm mechanics and household science, held in the early part of 1919. Now that the war is over, other buildings in connection with the school will be at once proceeded with and the school equipped for regular instruction in agriculture and household science.

The farm comprises two hundred acres of land adjoining the town of Kemptville, thirty miles from Ottawa. It is not proposed to make this an experimental farm in the sense that small plots will be used. The farm will be operated rather to demonstrate the benefits of thorough cultivation, the rotation of crops and of pure seed of suitable varieties. Twelve acres of orchard have been planted to the hardier varieties of apples.

Already an excellent live stock foundation has been secured, some first-class animals having been purchased. These will serve as material for class-room work, and besides helping to make the farm profitable to operate, will demonstrate the advantage of superior live stock to the neighbourhood. As the surrounding country is devoted to dairying, no beef breed will be kept. The horse stock is of good draft type and of Clydesdale breeding. The hog stock consists of Yorkshires of approved type. It is proposed to establish a poultry plant and to stock it with bred-to-lay Plymouth Rocks and Leghorns. Commercially, the farm will be operated as a live stock, seed, dairy, poultry and truck farm. The completed farm buildings consist of a horse barn, a hog pen and an implement shed. The existing cattle barn has been remodelled and a silo provided. The work of construction and general farm improvement will be continued systematically but not hurriedly, and several years will be occupied in improving the farm and its equipment. Nor will the work be elaborate; in fact it is the policy of the department to demonstrate approved methods of farming in the best possible way rather than to build up a model without regard to cost of maintenance and operation.

QUEBEC.

The Macdonald College is assisted by an annual grant of $25,000 made from agricultural instruction moneys. With the funds thus provided the institution has been enabled to greatly enlarge the field of extension work and to conduct certain lines of research. These include the following: Veterinary instruction, research in biology and entomology; animal husbandry extension; organization and supervision of home-makers' clubs and demonstrations in connection therewith; poultry extension; school fairs and the improvement of school grounds; root-crop investigations and seed fairs.

The School of Agriculture at Ste. Anne de la Pocatière and the Agricultural Institute at Oka each receives a grant of $25,000 to supplement the salaries paid to members of the staff and to provide equipment and building accommodation, thus strengthening these institutions for the benefit of the French-speaking community.

A special summer course in agriculture for boys from 12 to 19 years of age was offered at Ste. Anne de la Pocatière during July and August, 1918. The course was attended by fifty students.

SASKATCHEWAN.

The allotment to the College of Agriculture for teaching, research and extension services amounts to about $27,000 annually. The expenditure covers salaries and expenses of the following, either wholly or in part, viz.: Professor of agricultural engineering; professor of animal husbandry; professor of dairying; professor of chemistry; professor of poultry husbandry; instructor in field husbandry; a director of homemakers' clubs and an assistant; two field foremen.

The extension service included short-course work both at the college and at country points; the demonstration train; course for returned soldiers; dairy extension; the establishment of a system of butter grading; assistance in grading and marketing poultry products; judging at fairs; assistance to boys' and girls' clubs; supervision of homemakers' clubs and short course in household science.

ALBERTA.

The sum of $38,500 was provided to assist in financing the three agricultural schools in Alberta, contributing towards staff salaries, maintenance and supplies and equipment.

In addition to the regular work of the schools, special short courses are offered in gas engines, tractors, stock, grain, etc. The members of the staff also assist the

department in the series of short courses and lectures held at country points, and in other extension work.

With the ending of the war, the province of Alberta has again taken up the matter of agricultural education and will provide three additional agricultural schools, all of which are being located in the south and centre of the province. This will make six schools offering a two-year course of practical agriculture both for young men and young women. Following these two years, if they wish, they may attend the agricultural courses at the university and graduate, having their standing from these schools. The schools are located on half-section farms, which are used as demonstration farms.

BRITISH COLUMBIA.

From the grant to British Columbia the sum of $8,000 was, in 1918, allotted to the College of Agriculture of the University of British Columbia as a contribution towards the investigation and extension work of that institution.

NOVA SCOTIA.

As the Agricultural College at Truro is the centre of agricultural educational work for the province and, as well, of the activities of the Department of Agriculture —since the principal is also the secretary for agriculture—a fair portion of the grant under the Agricultural Instruction Act is applied to payment of the salaries of the members of the college staff and for building purposes. As a consequence of the aid thus given under the Act the efficiency of the college has been greatly increased. The provincial grant practically duplicates that given under the Agricultural Instruction Act.

INSTRUCTION AND DEMONSTRATION.

Of the general work in connection with field crops and live stock carried on by the provincial departments of agriculture and assisted directly or indirectly by the grant, it is difficult to give a brief and at the same time a comprehensive account. The undertakings form, as a rule, part of a general scheme for conveying information to the farmers involving the agricultural representatives, the short course, competitions in standing crops, stock-judging competitions, seed fairs, pig clubs, co-operative ownership of breeding stock, demonstration plots, seed distribution, clover huller demonstrations, and other lines of work. In most instances, to undertakings of this kind the grant gives merely a supplementary assistance, such as the payment of the salary and expenses of officers charged with special propaganda. It cannot be said, therefore, that there is a well defined scheme for promoting field husbandry or live stock husbandry independent of the general extension programme of provincial departments. A similar statement would hold good in regard to horticulture and dairying. The difficulty lies in indicating the precise amount of assistance rendered by the grant. An attempt to indicate the forms of work assisted may lead on the one hand to the misconception that the whole undertaking is financed by the grant. On the other hand, the ramifications are so extensive that the assistance indirectly given is apt to be overlooked. The agricultural representative system in the province of Ontario may be instanced as a case in point. There the federal grant meets the larger portion of the cost of this work. There can be no doubt that, with its many-sided application, it constitutes in that province the most potent agency for extension connected with the provincial department. The grant truly may be said to assist every one of the undertakings engaged in by these officers. But while it assists all, it does not completely finance any particular one. The same is true in a general sense of the well-organized extension

service of the Manitoba Department of Agriculture, of the schools of agriculture of Alberta and their extension activities, the Saskatchewan College of Agriculture and its extension work, and so on through the list.

In considering the aid given to seed and crops and live stock, dairying, horticulture and similar activities, no attempt will be made to follow it through its various ramifications. It must be understood that short courses deal with farm animals and field crops; that junior competition in the rearing of hogs and steers promote live stock husbandry, and that seed distributed through the medium of school children is an incentive to the production of better field crops. Only forms of work that receive special assistance will be dealt with at any length, it being understood that supplementary assistance is often given in many ways other than those directly under review.

THE AGRICULTURAL REPRESENTATIVE SYSTEM.

Much encouragement has been given under the Agricultural Instruction Act to the agricultural representative movement. In spite of the fact that certain provinces were greatly handicapped by the war in maintaining the personnel of their representative staffs, the scope of the movement shows, on the whole, a broadening tendency, which it is believed will become more marked from now on. In some of the lesser as well as in the larger provinces, much commendable work is being done by these men. In Nova Scotia, for example, the marked prominence given to demonstration features of the work, and the results attained, are worthy of praise and emulation.

It is evident that the principle of making the representative office the local motive centre around which shall revolve all branches of the department's field activities in crops, live-stock, horticulture, and even women's work, will prove in most instances to be a sound policy and give excellent results. The adoption of this principle and the more general extension of the movement will, it is believed, give a better return for the expenditure than a less concentrated policy is likely to yield. It would, therefore, appear desirable that, wherever possible, provinces should be encouraged to eliminate, in particular, some of the minor lines of work for which Agricultural Instruction funds are at present appropriated and employ these resources in establishing the representative system more generally. It is a question whether, in many instances, the grant is not being used at the present time for too great a variety of purposes. It is believed that by cutting out some of these minor lines and by concentrating on good representative work, not only would better results be secured but more complete accord would be established with the spirit of the Agricultural Instruction Act.

The organization of the agricultural representative system in Ontario and Quebec was described somewhat in detail in the report of 1917-18. No material changes have been made during the year and further reference to the subject in this year's report will be unnecessary, so far as these two provinces are concerned.

MANITOBA.

No part of the work of the extension service in Manitoba was interfered with to a greater extent by the war than the agricultural representative system. Owing to enlistment, at no time during the war were there more than three men in the field. There are now five men engaged in the work. In addition to this, the Rural Credits Society has three men in the field whose first business is to look after the Rural Credits Societies in their district, but who spend about half of their time on agricultural representative work. At places where there are no representatives, regular members of the extension staff carry on special features of the representative's work.

The agricultural representative work in Manitoba is placed on the following basis. The Department of Agriculture pays the salary of the representative up to

$1,800, also all of his travelling and living expenses when not at headquarters. The local community pays his salary from $1,800 to $2,500 and provides for office expenses. At each place a board of agriculture has been organized. This board consists of from nine to twenty members, depending on the number of municipal councils, agricultural societies, grain growers and others, who co-operate as committees with the representatives.

NOVA SCOTIA.

A good start has been made in agricultural representative work in Nova Scotia, in so far as the portion of the province yet covered is concerned. The island of Cape Breton is fairly well served by a staff of three representatives—a chief and two assistants. Besides these there is one in each of the two counties, Antigonish and Guysboro.

The work in Cape Breton began six years ago, or just after the grant under the Act became available. The claim is made that it has been the means of revolutionizing farming in that portion of the province and that the results would of themselves justify this whole grant to the province. The plan that has been followed is, therefore, worthy of special notice.

When the work of the representatives began on the island the amount of roots grown was a negligible quantity and crop rotation was uncommon. The plan adopted was to establish demonstration plots on suitably located farms, operated by suitable persons. Half an acre to an acre of land—usually sod land—was chosen and well prepared for the growing of turnips. The department paid half the cost of the fertilizer and took direction of the work, showing how all phases of it should be carried on. When demonstrations in such work as the thinning of the crop were being given, neighbours were invited to be present to see and take part in the work, and they availed themselves of the opportunity quite extensively.

In 1918 there were 12 such plots—most of them half an acre each—and the yields of turnips ranged from 990 to 1,540 bushels per acre. In addition to the plots established at carefully selected points each year, there have always been other plots carried on along precisely the same lines, with the only exception that the department bore none of the cost of the fertilizer. The latter have been established as a result of applications from farmers where there were no demonstration plots near by.

Crop rotation was a feature of the demonstration plot work. Following the turnips in the rotation came a grain crop and seeding down to timothy and clover and then two years under grass. Thus a four-year rotation was the one practised. Only first quality seed grain and grass-seed were used. Again, the free use of the fanning mill in seed selection was demonstrated and urged upon the attention of the farmers; and, in exceptional cases that seemed to warrant it, mills were purchased by the department for use in the work.

At the many meetings held, the value of crop rotation, from the standpoint of soil fertility and the value of the roots and other crops grown for the feeding of stock, were urged upon the attention of the farmers.

Before this work was started in Cape Breton farming was at a very low ebb. The quantity of turnips grown was infinitesimal and crop rotation was not practised. There was little good stock food grown and the stock kept was small in number and of poor quality. There has been a great revival. To-day turnips are quite a general crop, crop rotation is developing quite rapidly and there is a very marked improvement in the care and feeding of stock and the number and quality of stock kept. There are now some good, thriving creameries in operation in Cape Breton, and wheat production has developed to the extent of warranting what has already occurred, the establishment of small roller flour mills.

About three years ago, after the demonstration plot work had been well established, potato spraying demonstrations were started and these are meeting with a like measure

of success. At first the knap-sack sprayer was used, part of a field being sprayed and the balance left unsprayed, and then a barrel sprayer was purchased. At the beginning of the work the department paid half the cost of the chemicals. As an illustration of the success of this work it may be mentioned that one district purchased the large sprayer used in 1917. In 1918 four barrel sprayers were purchased by the department and used in different districts, and some, if not all, of these are likely to be purchased for use in the districts in which they were used last year.

Enough has been said to illustrate the character and extent of the work carried on, which cannot be too highly recommended for its practical utility.

All the agricultural representatives of the province assist in co-operative work, and particularly in organizing the farmers for the co-operative marketing of wool. In Antigonish county there is considerable co-operative purchasing done by the farmers. Considerable work has been done in Antigonish in the introduction of the use of lime and in getting the farmers into practising crop rotation and the growing of clover. The representative in Guysborough has also taken quite an active interest in the elementary agricultural educational work of the schools.

NEW BRUNSWICK.

In New Brunswick there are three groups of agricultural representatives, with a chief and an assistant in each. They cover three counties each, or nine of the fifteen counties of the province.

Considerable attention was given by the representatives to organization and co-operative work during the past year. For instance, valuable assistance was given in connection with the organization and establishment of a large central creamery at Moncton, which, by the way, has had a very successful year.

A large amount of work was done in the way of organizing the farmers for the co-operative marketing of wool and rendering assistance during the marketing period. In this work the representatives co-operated with the live stock branches, both Federal and provincial. Lectures and demonstrations were given in connection with the treatment of grain for smut. Considerable assistance was given in the securing and placing of live-stock, particularly sheep, for which the province is well adapted. In the potato sections of the province assistance was given in the way of spraying demonstrations, and the inspection of seed plots. During August and September considerable time was devoted to the inspection and judging of field crops. Not a little of the time of all of the representatives was devoted to furthering the increased production campaign. This may be said to have applied to the activities of several branches of the department.

PRINCE EDWARD ISLAND.

As there was but one agricultural representative in the field most of the year, and as he specialized in drainage work, the amount of regular representative work was limited.

This representative devoted much of his time, in the western part of the province, to survey work for open ditching and under-drainage and in directing the work done along this line. The ditching machine, purchased during the latter part of the season of 1917, was in operation throughout the season of 1918, if we except some unavoidable breaks in the work. The total amount of tile drain laid was 3,113 rods, or the equivalent of under-drainage for about 80 acres of land. Survey work was done for about 500 rods of open ditching, some of it for outlets for the tile drains. The results of drainage work done thus far have been very satisfactory, and there is every likelihood of the work being extended quite rapidly, as there is considerable land in the province that must be under-drained before it will produce satisfactory crops.

Considerable work was done along such lines as judging in standing field crop competitions, preparing for and assisting in judging at the Maritime Seed Fair held at Summerside in December, and assisting in the co-operative marketing of wool. There were about 53,000 pounds of wool marketed co-operatively in 1918, as compared with about 24,000 pounds in 1917.

THE AGRICULTURAL SHORT COURSES.

ONTARIO.

The Ontario agricultural representatives' short courses or classes for young farmers, were fairly well attended in 1919 in spite of the prevailing influenza epidemic. These classes have been held annually for the past eight or ten years in some counties, each year at a different centre, so that they may be accessible to all. While designed to benefit any one engaged in farming, they make a special appeal to young farmers of from eighteen to twenty years of age, who have been out of school for some time, and who begin to feel the need for special instruction in matters connected with the business of farming. Many representatives reported successful classes with marked interest being shown in spite of a somewhat general decrease in the numbers attending.

The classes are usually of four weeks' duration, and are planned, in a general way, to meet—so far as the limitations of such classes will permit—the needs of young farmers for information on the theory of agriculture and its application to farm practice. They are designed, in the second place, to supply information on special practical subjects such as the gas engine and electricity as sources of power, milk-testing, co-operation and marketing, farm accounts, and farm management. In some counties, arithmetic and business correspondence, farm buildings, and sewage disposal were among the special features. The needs of a locality based on a careful study of local conditions, such as every representative must make in order to fit his activities to the sphere of his operations are also kept in view and emphasized. Thus we find horticultural problems stressed in the Niagara and Lake Erie districts, dairying in central and eastern Ontario and the feeding of beef cattle in the beef sections, while, as would naturally be anticipated, in a province such as Ontario, where general agriculture is chiefly followed, animal and field husbandry topics, such as stock judging, and seed selection, are dealt with almost everywhere. To meet this situation specialists in such subjects, the best that can be procured by the provincial Department of Agriculture, lend their assistance. These include not only men who are recognized as successful in their particular line of enterprise, but also representatives of the Dominion Department of Agriculture and of the Ontario Agricultural College staff.

With the rapid development in the use of power on the farm, has come a desire on the part of those operating engines to learn more about their construction so as to employ them to better advantage. This is true not only of the gas engine, which is now being used for practically every purpose to which power can be applied on the farm, but also to the utilization of electrical power and the operation of tractors. To meet this particular demand, special courses were arranged at several points in the province, as at Chatham, where a five-day course was held in January in the theory and practice of mechanical farm power, gasoline engines and tractors. In Ontario, Haldimand and some other counties these subjects were also featured. No farmer in these days can afford to be without a knowledge of the information supplied by courses of this nature.

A motion picture outfit was employed to advantage in many instances, illustrating various agricultural operations, films prepared for the provincial agricultural department being used.

Every effort is made in these courses to keep the practical aspects prominently in view, and to illustrate the teaching by demonstration. A common practice is to spend

the forenoon in lectures and discussions, and to give over the afternoon to visiting near-by stock farms for the purpose of judging cattle, horses, sheep, and swine, and in some of the counties near Toronto the classes were taken to the union stock-yards, the parliament buildings and other places of interest in Toronto. From among those who show proficiency in stock-judging, a county team is selected to compete at the inter-county competition held at the winter fair in the fall. Young men taking the course are also eligible for the acre-profit, steer-feeding, dairy profit, hog-feeding, and other competitions held under the auspices of the Junior Farmers' Improvement Associations, the winners receiving free transportation and living expenses while attending the two weeks' course in stock and seed judging at the Ontario Agricultural College.

Another benefit derived from holding short courses is that the representative comes in touch not only with those attending the course, but with the parents and also with various associations, such as farmers' clubs, township councils and agricultural societies. In this way the course affords opportunities for the representative to build a foundation for future work in the community.

The social influence of the classes is also a factor of value. Thus, the opportunity is taken advantage of by those living in the same county or district to become better acquainted. Continuing this idea, it is the custom in many instances, to hold at the conclusion of a course a supper or social reunion to which the students bring their friends and relatives.

The work is assisted by the grant made to the province under the Agricultural Instruction Act, and its value in influencing agricultural standards in Ontario will readily be admitted. Perhaps an element of even greater worth will be found in the awakening of the minds of many to the value of education in increasing power and usefulness, with greater satisfaction in life as the outcome. An evidence of this awakening will be recognized in the fact that quite a large number of the short-course men are led to take the regular course at the Ontario Agricultural College.

QUEBEC.

One series only of short courses and lectures on agriculture and household science was held during the year, instead of two as formerly. The record of attendance was as follows:—

	Visits.	Lectures.	Demonstrations.	Attendance.
General Agriculture	312	386	68	25,912
Supplementary lectures	62	90	24	7,205
Domestic Science	..	132	33	19,280
	374	598	125	52,397

MANITOBA.

During 1918 there was a strong demand for extension schools, particularly for those at which considerable attention was given to the operation and repair of the gas engine.

Three distinct types of schools were provided:—

1. The ten-day travelling agricultural engineering schools, which included courses in gas engines, field crops, live stock and farm accounts for the men, and home economics subjects for the women.

2. The five-day schools in live stock, poultry and home nursing.

3. The two to five-day schools in live stock, dairying, poultry and bee-keeping.

Altogether twenty-one schools of ten days duration were held. The attendance at each course averaged 55 men and 30 women, with an aggregate attendance of 34,000.

The five-day courses, twelve in number, had an enrolment of 754 and an aggregate attendance of 9,175.

The two to five-day courses in live stock, poultry, and bee-keeping were held at places where these subjects were in special demand. Eight schools of this type were held with a total attendance of 2,362.

Institute Lectures.

In addition to the lectures given by the regular members of the extension staff, a considerable number of additional lectures are given by members of the Agricultural College staff, as well as by prominent farmers in the province. They have been generally given in co-operation with farm organizations and school boards.

During June and July a series of 110 meetings was held in connection with the women's institutes. The speakers chosen for these meetings were, for the most part, members of the most progressive women's institutes of the province.

The attendance at all of these meetings was very gratifying, and did a great deal to increase production and to conserve food.

For the work of the three types of schools during the months of January, February and March, 36 instructors were employed. Forty-one schools were held with an enrolment of 2,415 students besides many occasionals. Illustrated lectures were given to those who were not regularly enrolled. One of the most popular side-lines was a series of twenty lectures on concrete construction.

The number of short courses and the attendance in home economics was: Dress-making 78; millinery, 41; home nursing, 50; cooking, 106; canning, 111. Aggregate attendance 35,110.

CO-OPERATION AND MARKETING.

ONTARIO.

An increasing tendency is noted in Ontario towards the co-operative selling of farm products, particularly in connection with live stock. Four years ago there were practically no organizations shipping live stock. At the present time there are some 200 organizations participating in this enterprise, and during the year live stock was shipped co-operatively to the Toronto market to the value of a million dollars. All indications point to greatly increased activity in this form of co-operative marketing.

The efforts of the director of co-operation and markets to induce farmers' co-operative organizations to become incorporated is meeting with a larger measure of success as it becomes more clearly recognized that incorporation is necessary as a proper safeguard to business.

Farmers' clubs show a rapid increase, there being approximately some 600 clubs in active operation, the greater number doing a buying and selling business.

In addition to the farmers' clubs there are 30 general co-operative organizations of farmers, 91 breeders' clubs, 58 fruit associations, 50 egg circles, and also a number of organizations of growers of special crops. There are 1,000 cheese factories and 600 creameries in the province, many of which are owned by the patrons.

SASKATCHEWAN.

Throughout the period covered by this report the co-operative organization branch continued its activities in gathering and disseminating information relative to lines of co-operative endeavour applicable to Saskatchewan conditions. During the year 45 co-operative associations were registered, bringing the total of such asso-

ciations in the province up to 436. Special attention was given to the organization of co-operative live-stock marketing associations. These associations marketed 600 cars of live stock on which an average saving of one cent per pound was realized.

An endeavour was made to interest farming communities in co-operative production and a potato growing association was organized at Earl Grey, where some 40 farmers united to produce certified seed potatoes. Seed was secured through the co-operative organization branch and arrangements were made to have the growing crop inspected by a representative from the office of the Dominion Botanist.

Through the efforts of the branch a series of eight co-operative horse sales was organized under the auspices of local agricultural societies in the older settled portions of the province, the object being to find a satisfactory home market for the surplus of farm horses now existing. It is expected that these sales will develop into annual events, and plans are already under way for the holding of a much larger number in the spring of 1920.

The co-operative wool-marketing work which has been carried on each season since 1914 showed a most gratifying increase. A total of 916 consignments, aggregating 394,000 pounds of wool were handled.

The co-operative poultry marketing work which has been carried on under the direction of the branch since 1915 was taken over in the fall of 1918 by the Saskatchewan Co-operative Creameries, Limited. This procedure was in line with the general policy of the department which is to inaugurate and carry on undertakings of this kind only to demonstrate the usefulness of the project and then to turn the work over to any co-operative organization of producers that is in a position to carry it on in a satisfactory manner.

Speakers were provided to discuss co-operative producing and marketing problems and a number of meetings in different parts of the province were held, also considerable quantities of bulletins and pamphlets were distributed through the mails.

LIVE STOCK.

ONTARIO.

Live-stock improvement work in Ontario, in so far as it is assisted by the grant, is instructional in character. It consists: (1) of practical judging courses for farmers, and (2) short courses at the Ontario Agricultural College for judges at fall fairs. The live-stock competitions conducted under the auspices of the junior farmers' organization and the team competitions in live stock judging conducted by the agricultural representatives, are a means of affording valuable instruction, which should result in improving the type of live stock of the province.

Judging Competitions.

In connection with the short courses held by the agricultural representatives, the judging of live-stock is a prominent feature. A better knowledge of this subject on the part of the young farmers throughout the province is being developed by this means. Inter-county live-stock judging competitions are organized in connection with the winter fairs at Guelph and Ottawa. The interest in these contests resulted in practically every county being represented by a team.

QUEBEC.

Until last year the efforts of the Quebec Department of Agriculture in connection with the live-stock industry were directed chiefly towards hog and bacon production insofar as Instruction Act funds were concerned, mainly through the

abattoir at St. Valier. In 1917 and 1918 the grant was also drawn upon to promote the advancement of sheep-breeding, horse-breeding, and the improvement of dairy cattle, by means of personal visits to clubs and individuals owning breeding animals.

In districts where there are permanent agricultural representatives located, the inspection is carried on by these officers. Elsewhere, the work is performed by special instructors. A comprehensive bulletin on sheep was prepared and issued together with other pamphlets on animal husbandry.

To promote sheep husbandry Macdonald College has established demonstration flocks of pure-bred sheep at various points in the province. Seventeen of these flocks have been placed with farmers to date. The majority of these are of the Cheviot breed, which appears to be well adapted to Quebec conditions. Pure bred rams have also been distributed in a few instances to demonstrate their value in the improvement of grade flocks.

SASKATCHEWAN.

Three travelling instructors and demonstrators, one being a fully qualified veterinarian, carried on work during the year under the direction of the Live Stock Commissioner. They visited many farmers throughout the province, particularly those purchasing or desiring to start new flocks and herds, and gave instruction and advice in regard to the breeding, care and feeding of farm animals. They also acted as live stock judges at fairs. A portion of the grant was expended to secure the services of experts to address the annual convention of the Saskatchewan Veterinary Association.

ALBERTA.

At the demonstration farms pure-bred herds are being established to serve as centres for distribution. Four Shorthorns and three Holsteins were purchased during the year and added to the herds.

NEW BRUNSWICK.

Perhaps the most extensive work done by the Live Stock Branch, during the year, was that in connection with its sheep campaign, which may be considered under two heads, namely: (1) An effort to secure an increase in the number and an improvement in the quality of sheep kept; (2) encouragement of and assistance in the co-operative marketing of wool.

Many meetings were held in connection with both phases of the work, full use was made of the agricultural societies and, in some cases, wool-growers' associations were formed.

There were five carloads of pure-bred sheep imported and the department assisted in the distribution of about 1,400 sheep in all.

The co-operative marketing of wool has developed to quite an extent. Well up to 32,000 pounds of wool were marketed in this way, in 1918, and brought the very satisfactory average price of 77·2 cent. This co-operative movement is growing quite rapidly.

PRINCE EDWARD ISLAND.

The chief activities along live stock lines, during the year, were the encouragement given to the increased production of pork, and a campaign for an improvement in the quality and an increase in the number of sheep kept. Distribution of about 125 breeding sows was made, and there were four carloads, or about 160 in number, of rams and ewes—mostly Shropshire and Oxford—imported for the farmers of the province.

DAIRYING.

SASKATCHEWAN.

During the period covered by the report, the butter-grading work, which has been conducted by the dairy branch since 1914, has steadily grown in importance, and of late has been greatly extended, there being an increase of approximately 30 per cent in the total quantity of butter graded during the year, as compared with the twelve months previous. A complete report of the score, with suggestions for improvement, is sent to the buttermaker immediately the grading is done. A great improvement has resulted in both quality and uniformity of output.

Four instructors were at work during the summer season and three during the winter months. All cream in the province is now purchased on quality or grade basis, and an important feature of the work of the travelling instructors is to visit the creameries and cream-buying stations to advise the different buyers regarding grade standards for cream and to assist in having uniform standards adopted at all points. A considerable amount of time is also spent by the instructors in making personal visits to the cream producers.

Very marked improvement in the quality of the cream delivered has resulted from this personal work amongst the creamery patrons. The instructor, by visiting the farmer, is able to investigate the methods practised in producing and handling the cream and give advice and suggestions for improvement. The value of this work is vastly increased because of the instructor being in a position to say that a higher price is invariably paid for the higher quality.

During the summer months speakers were supplied for a number of farmers' meetings called to discuss dairy questions and judges in dairy products were also supplied for a considerable number of fairs. At points a long distance from a creamery, or where, for any reason, such information was desired, the men doing the judging, and also the instructors in the course of their regular work, gave information regarding the manufacture of dairy butter.

During the winter months, in addition to giving assistance in the holding of short courses arranged by the extension department of the University, the dairy branch also arranged special dairy meetings at twenty-eight different points in the province. At these meetings addresses were given in practical dairying subjects and, wherever possible, demonstrations in the judging of dairy cattle. At all meetings lantern slides were used illustrating various features of the work dealt with by the speakers, and where it was not possible to have demonstrations on live animals, special attention was given to type, handling, qualtity, etc., in showing the slides of the different dairy breeds. The use of the lantern slides proved a feature of special interest at these special dairy meetings, at which a total attendance of 1280 was reported. In addition to the regular meetings, special talks on dairying were also given to school children, at a number of points, during the afternoons.

BRITISH COLUMBIA.

Many valuable lessons have been learned from the work carried on by the various cow-testing associations in British Columbia. Active associations are well established at four or five points and some two thousand dairy cows are constantly under test. The system followed provides that the tester visit the farm of each member of the cow-testing association each month. The information afforded by the records obtained by this means gives the farmer a very close approximate of the performance and profit or loss of each individual cow in the herd.

The benefit of this method of keeping dairy records is very forcibly shown by two years' work in the Comox Association, where the following marked increase in the production of individual cows was shown:—

The number of cows producing 400 pounds of fat and over in 1916 was 4; in 1917 it was 15.

The number of cows producing 300 pounds of fat and over in 1916 was 29; in 1917 it was 75.

One of the most gratifying results of the work is the very considerable increase of production of individual herds.

QUEBEC.

The dairy industry being a very important branch of agriculture in the Province of Quebec great efforts are being made to induce farmers to improve their herds through the use of good sires. To this end, officers of the provincial department visit agricultural associations and individual farmers and advise as to the selection of breeding stock and its care and maintenance.

At the St. Hyacinthe Dairy School, six winter courses were held for the instruction of cheese and butter makers. The fifty dairy instructors employed by the department on inspection work, are given a special four-day course each year at the institution.

NOVA SCOTIA.

The rather marked development in cooperative dairying in Nova Scotia dates from the time that the grant, under the Agricultural Instruction Act, became available. The work was then organized under a capable superintendent of dairying, and has developed very rapidly during the past five years. It is but a few years since the value of the combined output of the creameries and cheese factories of the province was considerably under $100,000. In 1917 there were twenty-two creameries and three cheese factories in operation, the value of whose output exceeded $700,000. The 1918 output was about the same as in 1917.

Considerable attention was given to the grading of cream and this had the effect of materially improving the quality of the cream supplied to the creameries and of the butter made from it. Butter from fifteen out of the twenty-two creameries of the province was stored during the summer to determine its keeping qualities, and was exhibited and scored at the annual convention of the Dairymen's Association for the two-fold purpose of education and the awarding of prizes.

It is during recent years, since the impetus given the dairy industry, that the Dairymen's Association has been formed. The association holds an annual convention at the Agricultural College, Truro.

The staff of the dairy branch of the department, which had become depleted through enlistment, was strengthened by the appointment of an assistant to the superintendent of dairying, who devoted his attention to creamery inspection.

The superintendent of dairying notes in his report that the greatest weakness of the dairy industry of the province is the small production per cow, and emphasizes the need of cow-testing, weeding, breeding and good feeding, if dairying is to be made the profitable calling that it should be.

NEW BRUNSWICK.

The main features in connection with the development and improvement of the dairy industry during the year were: (1) The establishment and operation of a central creamery at Moncton, and (2) fuller inspection and instruction in connection with the cheese factories, and the grading of cheese.

The Moncton creamery is well located, well equipped and quite well patronized. The output for the first year was approximately 150,000 pounds. A few similar creameries, well located, would do much to foster the growth of the dairy industry.

which, on the whole, must develop along creamery lines. At present there are large sections of the older settled portions of the province where there is practically no co-operative dairying carried on, and where the number of dairy cows kept is small.

Through thorough inspection and instruction work, and the grading of the cheeese for the market, a decided improvement has been worked in the quality of New Brunswick cheese during the past year.

PRINCE EDWARD ISLAND.

There were, in all, thirty-eight cheese factories and creameries in operation in Prince Edward Island—twenty-four cheese factories, ten creameries, and four combined cheese factories and creameries. As co-operative dairying is an established industry in the province, the work of the superintendent of dairying consisted very largely of instruction and inspection work amongst the factories and the visiting of patrons.

In addition, a thorough survey was made of conditions in the eastern part of the province with the object of ascertaining the cause of and the remedy for the decline in co-operative dairying in that section.

MARITIME DAIRY SCHOOL.

The Maritime Dairy School was held in Truro during March, the attendance being nine students in cheese-making, ten in milk-testing and twenty-two in creamery work. The teaching staff consists of the dairy officials of the three provinces together with members of the staff of the Nova Scotia Agricultural College. Railway fares are refunded to students, and the expense of the course are met from the grant.

POULTRY HUSBANDRY.

ONTARIO.

The poultry stock of several of the provinces has undoubtedly been greatly improved by the distribution of eggs for hatching to rural school children in connection with the school-fair movement. In the province of Ontario during the past few years, eggs of a bred-to-lay strain of utility breds of poultry such as Barred Plymouth Rock, Rhode Island Red and White Wyandotte, have by this means been distributed pretty generally over the province.

MANITOBA.

Manitoba reports that as a result of the distribution of eggs to boys' and girls' clubs, pure-bred poultry are now found on thousands of Manitoba farms where a few years ago nothing but scrub fowls were kept. It is felt that in future it will not be necessary to supply eggs free to club members as pure-bred stock can be found in every locality. Much of the poultry work in Manitoba consists of lectures to boys' and girls' clubs, dressed poultry fairs and poultry lectures at the short courses. Between fifty and sixty combined seed-grain and dressed-poultry shows were held.

QUEBEC.

Some twenty-seven thousand eggs were distributed by the poultry branch of the Quebec Department of Agriculture to the pupils of elementary schools and others. Practically the eggs only of American breeds were included in this distribution: Rhode Island Red, Plymouth Rock and Wyandotte. Most of the eggs were supplied by the poultry stations of the department, by the co-operative associations, and Mac-

donald College. The distribution was made through the agricultural representatives and under their direct supervision, with the help of institutes and agricultural co-operative associations.

The poultry work carried on by the Quebec Department of Agriculture consists of (1) the operation of poultry rearing stations, sixteen in number, in various sections of the province; (2) the operation of co-operative incubators; (3) poultry housing demonstrations; (4) the distribution of eggs for hatching to rural school children, and (5) short courses and exhibitions.

The work is supervised by the chief of the poultry division of the department, having under him ten instructors who visit the stations and superintend operations, each having from two to four stations under his care.

Co-operative incubators are operated at seven points, each in charge of an instructor, to which the farmers in the district bring eggs for hatching.

During the year, the poultry branch contributed to the erection of twenty new houses, besides remodelling old ones. An instructor from the department directs the work, the Experimental Union supplies a carpenter and the proprietor the additional labour. The occasion is taken advantage of to instruct those in the vicinity in up-to-date methods, and the owner is required to report progress for at least one year.

Macdonald College also has established poultry stations in co-operation with farmers at various points. For this demonstration, poultry houses of a type suitable for the farm were erected, each accommodating from seventy-five to one hundred hens. Barred Plymouth Rock pullets were supplied as foundation stock, and male birds were distributed annually by the poultry department. Each farmer carrying on the work is required to keep account and to report monthly to the college. The houses have proved very successful, and egg production has increased each year. The number of chickens reared has also increased materially and the quality of the flocks has improved. These demonstrations have influenced the industry in the neighbourhood very considerably, and the flocks are drawn upon for foundation stock of the utility type in the respective communities. At the present time there are sixteen poultry houses in which flocks of fowls have been placed headed by male birds bred at the college. These flocks supply hatching eggs for distribution among the school children.

BRITISH COLUMBIA.

To encourage the poultry industry in the more remote sections of British Columbia, a number of breeding stations have been established. A suitable man is selected in each district, is provided with a flock of pure-bred birds and is required to sell fifteen settings of eggs at a fixed price, and to demonstrate the work. At the end of the year the flock becomes the property of the operator.

Egg-laying Competition.

The province participates annually in the International Egg-laying contest. The local contest, which extends over twelve months is conducted under the supervision of an officer of the Agricultural Department.

NOVA SCOTIA.

As an aid to the improvement of housing conditions for poultry, the local Department of Agriculture has, from year to year, helped to erect demonstration poultry houses on farms at suitable central points, through furnishing plans and lending financial aid to the extent of about $100 for each such house erected. These have served as models and many good houses have been built as a result. For instance, as a consequence of the erection of one at Bridgetown, there have been fifteen similar houses built in that locality.

There were three egg circles in operation in the province last year. The method of handling the eggs is to place them in a solution of water-glass, in a cement tank built in a clean, cool basement. The department defrays the cost of building the first tank, directs the work and markets the eggs.

The superintendent of the poultry work directs his efforts to assisting the farmers in the growing and securing of suitable foods, in the improvement of their stock, the building of suitable poultry houses and the care and marketing of eggs under the most favourable conditions.

NEW BRUNSWICK.

The two cardinal principles in the policy of the poultry branch, in its efforts to develop the poultry industry of the province, have been the introduction of pure-bred stock from a general utility breed and concentration upon a single breed for this purpose.

In order to stimulate interest and further the ends sought, considerable time and attention were given to the organization of boys' and girls' poultry clubs, for children ranging in age from twelve to eighteen years. There were eighteen such clubs organized during the winter of 1917-18 and twenty during the past winter. Last year over 12,000 eggs were distributed amongst club members, each receiving fifty eggs and being bound to exhibit all of his or her hatch at the joint fair of the pig and poultry clubs and to return four chickens to the department, in the fall, in payment for the eggs received.

Most of the birds received in the fall were put into crates at the Dominion Experimental Station, Fredericton, and fattened, after which they were properly killed, dressed and marketed.

FRUIT AND VEGETABLES.

ONTARIO.

Vegetable Demonstrations.

The work of the vegetable specialist of the Ontario Department of Agriculture is provided for by the grant. During the year a complete survey was made of the province in connection with the industry. The survey led to the conclusion that generally speaking the men in the business were uninformed as to the experimental work being carried on by government institutions.

As in previous years considerable attention was given the branch to methods of dealing with insects and fungoid troubles. A garden tractor was demonstrated at several points. In the autumn, most of the specialists' time was devoted to instructing returned soldiers in vegetable growing at the Guelph Convalescent Hospital, in response to a strong demand for information of this character.

QUEBEC.

The work of the horticultural branch of the province of Quebec is financed mainly by the grant, and covers a wide range of activities. These include fruit growing, vegetable growing and canning, the production of nursery stock, the supervision of school gardens, and the preparation and distribution of bulletins.

The aim of the fruit-growing division is to encourage the growing of fruits through the medium of the horticultural societies and by means of demonstration orchards and stations. Six demonstration orchards are being conducted in the leading fruit growing sections. In addition, some fifty fruit stations are scattered throughout the province, constituting centres from which owners of orchards in the locality can readily secure information. A director of demonstration orchards and a superintendent of fruit

stations make inspections and give the necessary guidance. The teaching is done through lectures and demonstrations given in the orchards. The department's instructors visit the members of horticultural societies, 5,000 in number and give demonstrations in planting, pruning and spraying. Facilities are extended to the membership in connection with the purchase of fruit trees, implements, spraying outfits and spraying materials. At Berthierville a fruit tree nursery of twenty-five acres has been established. Stock from the nursery is distributed as school garden premiums. Fruit trees, mostly apples, are distributed through the horticultural societies.

The vegetable section conducts an experimental plot at Villa Belvedere, to ascertain the best varieties of vegetables for the province. The staff is employed in visiting and giving information to vegetable growers during the summer and in lecturing in the winter. Judges at fairs are also supplied.

The horticultural branch furnishes free seed to children engaged in school gardening, besides assisting in the conducting of school fairs. This work is under the direction of a superintendent of school gardens.

Work in connection with the canning of fruits and vegetables is being carried on by a specialist with the object of inducing farmers and vegetable growers to can garden produce for their own use.

The horticultural department of Macdonald College operates three demonstration apple orchards, and holds orchard meetings from time to time in connection therewith.

BRITISH COLUMBIA.

At Summerland, in the Okanagan Valley, the plantation of Mr. J. H. Hilborn, is being conducted as a demonstration in fruit and vegetable growing. Mr. Hilborn owns the farm and the crops but receives a small subsidy from the Federal grant for revealing his methods to the public, and stating exactly what his receipts and expenditures are. The enterprise constitutes a demonstration by a farmer rather than a government demonstration station, and is, therefore, free from the criticism that the results are secured by the lavish expenditure of government money. The Hilborn farm comprises about ten acres. In 1917, the gross returns were $7,195.10; the expenses were $2,237.85; and the net revenue $4,957.25. Fifteen different crops including fruit and vegetables, were grown, and the above figures were given in the sworn statement of receipts and expenses furnished the Department of Agriculture. Not all the crops grown have been profitable each year, but the aim has been to show that, with diversity and modern methods, the annual revenue from the plantation would be satisfactory. Other growers are at liberty to inquire into and follow the methods and practices adopted.

NOVA SCOTIA.

In Nova Scotia the horticultural division of the Agricultural College operates two types of demonstration orchards with the assistance afforded by the grant. The model orchards, thirty-five in number, ranging from one to two acres in extent, are located outside the proven fruit districts but where conditions are regarded as promising. Their object is to determine the most suitable varieties of apples for the respective districts, and to demonstrate proper methods of care and management. The department supplies the trees, spraying outfit, a limited amount of fertilizer, and where necessary a limited quantity of tile for under-drainage. Generaly speaking, the undertaking has proved reasonably succesful.

The second type is the demonstration orchard. These consist of bearing orchards which were taken over by the horticultural division for a period of five years to demonstrate the advantages of approved cultural methods. This work was begun in 1914, and there are now eight of these orchards.

Demonstrations with Vegetables.

In ten of the Nova Scotia supervised orchards vegetable gardens were operated in 1918 as demonstration in vegetable growing. The department supplied the seed and fertilizer necessary for a quarter of an acre, and directed the work. Demonstrations in potato spraying were also given during the year.

NEW BRUNSWICK.

Considerable attention is given to orchard demonstration work in New Brunswick by the horticultural division. The demonstration takes three forms: (1) Illustration orchards, eleven in number, which were originaly planted and have since been cared for by the department; (2) demonstration orchards, these being renovated and cared for under the direction of the department, and (3) test orchards. The test orchards are a new feature, introduced in 1918, on farms at different points in the province. In these orchards Fameuse, McIntosh and Alexander were planted side by side to ascertain the value of the two former in comparison with Alexander, a variety recognized as thriving well under New Brunswick conditions.

Considerable attention was given to the co-operative marketing of apples. These were graded and packed at a central warehouse, instead of in the orchard as formerly.

The general work of the division is to give advice to farmers in the selection and preparation of orchard sites, and in planting, pruning, grafting, and spraying. In all, over 230 orchards were visited.

MISCELLANEOUS.

ONTARIO FARM MANAGEMENT SURVEY.

The Ontario Department of Agriculture has compiled the information secured in the second farm management survey carried out by the director of farm surveys of the Ontario Agricultural College. The first annual survey, which was made in the township of Caledon, Peel county, on one hundred and thirteen farms, was dealt with in the report of 1917-18. The second survey was made in Oxford county, where four hundred and thirty-seven farms were examined. This county was selected because dairying is followed almost exclusively and represents cheese-making, butter-making, city dairy trade and the making of condensed milk and milk powder.

Conclusions from survey:—

1. That farm profits of the average farmer increase as the size of farm increases.

2. That many farms can be profitably increased in size by clearing and draining rough land.

3. That there are many opportunities for increasing profits without increasing the size of the farms.

4. That the greatest opportunity lies in increasing returns from live stock.

5. That this increase can be most effectively obtained by better breeding methods.

6. That an increase in crop yields brings greater profits, but only if accompanied by keeping up and improving the quality of the live stock.

7. That efforts should be made by dairymen to produce at least 40 per cent of their milk in the six winter months.

8. That the best organized business for the average dairy men is that which gives about 70 per cent of the total revenue from dairy cattle and the balance from other sources, crops, hogs, horses, etc.

9. That the dairy business offers large returns for men specially fitted for specializing in high producing cows.

Details upon which the above conclusions were based are presented in tabular and descriptive form in a pamphlet issued by the Ontario Agricultural College.

SILO DEMONSTRATIONS IN BRITISH COLUMBIA.

During the year of 1918 silo demonstration work has been carried into two districts where the farmers have not yet realized the advantage of using silage to feed their live stock. Three modern demonstration silos were put up and demonstrations in filling were given in the presence of well attended meetings.

Greater interest is being shown by the farmers in the feeding of silage to beef stock, and silos were built in several places to provide succulent feed for cattle which as a rule have been fed principally on dry hay during the winter. Several of the larger stock ranches are at present considering the advisability of using silage when wintering their stock.

There has been a large increase during the last year in the number of silos in the province. The system which has been followed during the last four seasons by the live stock branch of the Department of Agriculture of assisting in the building and filling of silos in new districts with funds provided under the Agricultural Instruction Act has introduced them into the majority of the farming communities. Up to the present time sixty-three silos have been built and fifty-one filling demonstrations held. Ontario is the only province in Canada that has more silos per capita than British Columbia.

DEMONSTRATION FARMS AND EXPERIMENTAL STATIONS.

FORT WILLIAM STATION.

The Northern Ontario Plant Breeding Station at the Industrial Farm, Fort William, carries on a useful line of work provided for under the Agricultural Instruction Act. Considerable new work was undertaken in 1918 and included, by plant breeding, the production of several varieties of strawberries especially suited for Northern Ontario.

Among the importations of nursery stock were specimens introduced from Asia. The tree fruits were increased by the planting of the Hibernal apple and Dartt crab to be used for top-working. Hybrid varieties of apples and plums raised in the nurseries of the Prairie Provinces and the northern states were introduced, as well as some promising Russian pears.

A shipment of Bacurjancy apple seedlings produced from seed secured in the Caucasus Mountains in Russia were set out. These are stated to be as hardy as the Pyrus baccata and much superior in size and quality.

In vegetable work sufficient variety tests were made to give strong hopes that especially useful varieties of peas, celery, lettuce, beets and other classes will be developed. Steps have been taken which will probably result in obtaining some improved varieties of potatoes.

This station is doing an important work in the distribution of planting material. Distribution which commenced last year comprised forest-tree seeds, forest-pulled seedlings, fruit trees, fruit seeds, vegetable seeds and flower seeds which were sent to different customers. This distribution, it is expected, will grow rapidly with the coming years.

KEMPTVILLE DEMONSTRATION FARM.

The progress being made in the development of the demonstration farm in connection with the school at Kemptville, Ont., is given in the chapter dealing with agricultural colleges and schools in this report.

ALBERTA DEMONSTRATION FARMS.

A number of demonstration farms were inaugurated by the Alberta Department of Agriculture some years ago. They were located at widely separated points so as

to represent as nearly as possible the varied conditons of soil, climate and rainfall. At three of the farms, schools of agriculture have been located, and it was the intention eventually to make each farm the centre for such a school. The grant has assisted chiefly in the purchase of stock, including representative animals of dairy and beef breeds, which are maintained for breeding purposes. During the year under consideration the purchases made were chiefly for the purpose of strengthening the beef herds. To this end a number of registered Shorthorns were put on the farms at Sedgewick, and of Herefords at Claresholm.

DEMONSTRATION FARM AT KILLARNEY, MAN.

The Demonstration Farm at Killarney, Man., consisting of seventy-five acres was intended originally to be developed as a permanent horticultural station. This plan has since been deviated from to a certain extent. While a portion of it has been planted to fruit, the remainder is being operated as a general farm to demonstrate the value of good cultivation, seed selection and crop rotation.

Only sufficient live stock is kept to satisfy the needs. An effort is being made to develop a good strain of Berkshire hogs. In poultry, plans are being made to establish a farm flock of one hundred hens of a bred-to-lay strain of Plymouth Rocks.

The buildings consist of a house, barn, machinery shed, poultry house and ice house. Particulars of these and the fruit plantation are given in the report for 1915-16, pages 60, 61. The seasons of 1917 and 1918 were rather unsatisfactory both for cereals and horticulture on account of climatic conditions.

BRITISH COLUMBIA DRY-FARMING STATIONS.

To endeavour to prove the value of the Nicola and Northern Lillooet districts, the provincial Government in 1913 decided to establish a dry farming station at Quilchena and at 105-Mile House. These farms were started under the supervision of the lands department and were directed by that department until 1917, when they were transferred to the Department of Agriculture, and current outlay charged to the grant. During the period that the lands department was supervising these farms, extensive experimental work was carried on with different grains and grasses, and valuable results were obtained.

When the Agricultural Department took over the two stations it was considered better policy—for the time being at any rate—to endeavour to make these farms self-supporting. It was expected that by stocking up the place with sheep, hogs, or whatever best returns could be realized from, sufficient profits could be made to offset the expense incurred through experimental work. Both farms are already fairly well stocked with sheep, the 105-Mile farm having about eighty head and the Quilchena farm about 150 head. Cattle will also be kept as soon as sufficient fodder can be raised on the place. It is hoped this line of farming will place these farms on a more productive and paying basis.

FEDERATION OF WOMEN'S INSTITUTES OF CANADA.

A Dominion-wide women's organization to be known as the Federation of Women's Institutes of Canada was formed in Winnipeg in February. The new organization constitutes a federation of provincial women's rural organizations known as Women's Institutes, Homemaker's Clubs and Home Economic Societies, assisted by the Agricultural Instruction Act. The constitution provides that the federation shall consist of three representatives from each province, two of them to be chosen by the provincial convention and the third to be the superintendent for the province, or his or her appointee. A federal convention is to be held once a year and Toronto was chosen as the convention city.

The objects of the Federation of Women's Institutes are to unite the influence of Canadian women to promote educational, moral, social and civic measures, and to

bring into communication and co-ordination the various women's institutes and like organizations throughout the Dominion; and further, to be a clearing house for institute activities and information, and to outline and encourage nation-wide campaigns in the interest of the whole people, including homemaking, child welfare, education and community efforts. The organization is to be strictly non-partisan and non-sectarian.

VETERINARY COLLEGES.

It is universally conceded that live stock is an absolute necessity to successful agricultural development through assisting to maintain soil fertility and by converting the cheaper materials grown on the farm into higher-priced finished food products. In the achievement of this, veterinary skill and science materially assists by safeguarding the health of live stock and preventing losses through various ailments and diseases.

In recognition of this service there are now established veterinary colleges maintained by the governments of all countries for the training of young men for the veterinary profession. In Canada there are two essentially veterinary colleges in existence. One is the Laval Veterinary College at Montreal, maintained by the Quebec Department of Agriculture. At this institution the instruction is given in French. The other is the Ontario Veterinary College at Toronto, maintained by the Ontario Department of Agriculture for English-speaking students. Both of these institutions have university affiliation and receive aid from the Dominion Government under the Agricultural Instruction Act.

The opportunities existing in Canada to young men entering the veterinary profession are regarded as excellent. Apart from the ever-increasing field for veterinary surgeons throughout the Dominion, there is a constant demand for trained veterinarians as inspectors in the Health of Animals Branch of the Dominion Government as executive officers, investigators and qualified meat inspectors.

There are increasing demands for veterinarians in the various departments of agriculture, as inspectors of stallions for enrolment and for other branches of live stock work and instruction. Many cities and towns are in need of properly trained veterinarians to inspect dairies and abattoirs and to supervise the production of milk, meat and other food products. The field of veterinary science so far has only just touched the fringe of its possibilities and offers many opportunities for the young man of worthy ambitions.

THE ONTARIO VETERINARY COLLEGE.

A few years ago the course at the Ontario Veterinary College was extended from three to four years. In recognition of the extended training, the regular course will now lead to the degree of B.V.Sc. instead of V.S., as was formerly the case. For the degree of D.V.Sc. a supplementary examination by the University of Toronto (with which the veterinary college is affiliated) is necessary.

In the autumn of 1918, on the resignation of the Principal, Dr. E. A. A. Grange, who had acted in that capacity since the retirement of the late Dr. Smith, the founder of the institution, Dr. D. C. McGilvray, of the Manitoba Agricultural College, was appointed to the principalship.

The institution is now recognized by the United States Department of Agriculture as well as by the American Veterinary Medical Association, and it is the policy of the Ontario Department of Agriculture to make it one of the foremost institutions of the kind on the continent.

VETERINARY SCHOOL, MONTREAL.

The new veterinary hospital in connection with this school—the construction of which has been made possible by the Agricultural Instruction grant—was formally opened on December 10, 1918. It is expected that the new building, with its modern equipment, will greatly facilitate the work of instruction.

GRANTS FOR VETERINARY SCIENCE INSTRUCTION.

The number of students, British subjects, enrolled in 1917-18 at the institutions entitled under the Agricultural Instruction Act to participate in the grant of 1918-19 to veterinary colleges was as follows:—

Ontario Veterinary College	86
School of Veterinary Science, Montreal	43

Based on the above enrolment, the grant of $20,000 was apportioned as follows:—

Ontario Veterinary College	$13,333 33
School of Veterinary Science, Montreal	6,666 67
	$20,000 00

The following are the statements of expenditure of the grant by the two institutions:—

Ontario Veterinary College, April 1, 1918, to March 31, 1919.

Balance on hand, April 1, 1918		$7,147 81
Salaries, lectures and demonstrations	$4,341 28	
Laboratory and library supplies	369 78	
Printing and advertising	842 51	
Incidentals	1,481 60	
Balance on hand, March 31, 1919	112 64	
		$7,147 81

School of Veterinary Science, Montreal, to June 30, 1919.

Agricultural Instruction Grant, 1918-19		$6,666 67
Salaries of teaching staff	$6,510 00	
Laboratory work	156 67	
		$6,666 67

AGRICULTURAL INSTRUCTION GRANT OF 1918-19.

Dates of Payments and Amounts Paid to Provinces.

Ontario	May 31, 1918	$ 80,651 63
	January 10, 1919	80,651 63
	September 15, 1919	175,000 00
Quebec	April 6, 1918	25,000 00
	June 12, 1918	90,556 88
	June 15, 1918	20,000 00
	November 19, 1918	20,000 00
	December 3, 1918	115,556 88
Manitoba	August 16, 1918	38,556 55
	February 27, 1919	38,556 56
Saskatchewan	December 26, 1918	46,864 24
	September 20, 1919	46,864 24
Alberta	September 23, 1918	33,482 81
	December 3, 1918	33,482 81
British Columbia	August 15, 1918	10,000 00
	December 5, 1918	5,000 00
	December 17, 1918	19,599 53
	May 7, 1919	34,599 53
Nova Scotia	May 13, 1918	20,000 00
	June 15, 1918	20,858 24
	September 6, 1918	40,858,35
New Brunswick	June 21, 1918	32,055 40
	October 31, 1918	32,055 40
Prince Edward Island	July 15, 1918	15,874 61
	December 3, 1918	15,874 61
Veterinary Colleges.		
Ontario Veterinary College (Grant of 1915-16)	April 4, 1918	14,869 56
School of Veterinary Science, Montreal	January 10, 1919	2,626 00
	February 11, 1919	4,040 67

SESSIONAL PAPER No. 15a

STATEMENTS, BY PROVINCES, OF THE EXPENDITURE OF THE AGRICULTURAL INSTRUCTION GRANT FOR THE FISCAL YEAR ENDED MARCH 31, 1919.

Province of Ontario—Grant of 1918-1919.

Summary Statement, April 1, 1918, to March 31, 1919.

No.	Classification.	Balances April 1.	Grant.	Refunds.	Total Credits.	Expenditure.	Credit Balance.
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1(a)	O. A. C. capital expenditure	5,873 40	135,000 00	....	140,873 40	3,613 75	137,259 65
1(b)	" salaries and additions to staff	3,953 94	15,000 00	100 00	19,053 94	18,260 60	793 34
2(a)	Agricultural School, Kemptville (capital)	.. ..	60,000 00	.....	60,000 00	55,642 87	4,357 13
2(b)	Agricultural School, Kemptville (mtce.)	47,702 95	20,000 00	5,297 89	73,000 84	36,308 84	36,692 00
3	Agricultural representatives (including balances under (1) O. A.C. capital, $115,000; (7) stock and feed judging, $2,462 76).	117,507 87	21,630 29	848 10	139,986 26	138,772 57	1,213 69
4	Household science extension work		1,500 00	..	1,500 00	1,116 43	383 57
5	Co-operation and markets	385 33	7,000 00	500 00	7,935 33	7,705 67	229 66
6	Demonstrations in vegetable growing	38 96	7,000 00	200 00	7,738 96	7,283 65	455 31
7	Stock and seed judging courses and institute work	..	672 97	530 75	1,203 72	1,203 72	..
8	Women's institute work	1,799 00	5,000 00	1,289 02	8,088 76	7,996 40	92 36
9	O.A.C. short courses (acre-profit comp.)	561 03	200 00	1,429 60	3,990 63	1,776 10	2,214 53
10	Lectures on horticulture	430 07	500 00	..	930 47	367 86	562 61
11	Demonstrations in growing and handling fruit	100 00	2,000 00	..	2,100 00	1,296 35	803 65
12	Demonstrations vegetables, New Ontario	367 16	4,500 00	100 00	4,967 16	4,439 36	527 80
13	Horticultural Experimental Station	1,578 31	2,000 00	..	3,578 31	2,510 45	1,067 86
14	Drainage work	4,468 28	2,500 00	306 45	7,274 73	4,605 35	2,669 38
15	Demonstration work on soils	697 54	3,500 00	500 00	4,697 54	4,480 02	217 52
16	Demonstrations in bee-keeping	616 14	500 00	..	1,116 14	891 08	225 06
17	" growing and handling corn	73 06	3,500 00	100 00	3,673 06	3,476 15	196 91
18	Demonstrations in live stock and poultry	883 67	2,000 00	..	2,883 67	.. ..	2,883 67
19	Elementary agricultural education	28,998 14	40,000 00	42 08	69,040 22	60,561 42	8,478 80
	Short courses for fall fairs	902 42	.. ..	..	902 42	55 30	847 12
	Agricultural aid account—						
	Dairy demonstrations	15 81	..	....	15 81	.. ..	15 81
	Dairy survey	215 51	..	..	215 51	.. ..	215 51
	Live stock in Northern Ontario	3,427 84	..	..	3,427 84	.. ..	3,427 84
	Milking Shorthorns	1,856 11	.. ..	.. ..	1,856 11	.. ..	1,856 11
	Miscellaneous	1,869 24	.. ..	.. ..	1,869 24	.. ..	1,869 24
	Ontario veterinary college additional land	12,819 93	.. ..	.. ..	12,819 93	.. ..	12,819 93
		237,142 85	336,303 26	11,293 89	584,740 00	362,363 94	222,376 06
	Less agricultural aid balances	..	.. ..	.. ..	.. ..	.. ..	20,204 44
	Balance agricultural instruction account	..	.. ..	.. ..	.. ..	.. ..	202,171 62

PROVINCE OF QUEBEC—BALANCE OF GRANT, 1917-18.

SUMMARY STATEMENT, April 1, 1918, to June 30, 1918.

No.	Classification.	Balance April 1, 1918.	Expenditure.
		$	$
1	Schools of agriculture	13,764 11	13,764 11
2	School of veterinary science, building extension		
3	Breeding	4,844 01	4,844 01
4	Poultry	3,482 63	3,482 63
5	Bacon		
6	Horticulture	9 99	9 99
7	Experimental orchards	2,621 64	2,621 64
8	Dairying	157 96	157 96
9	Agricultural representatives	5,287 93	5,287 93
10	Seed	9 95	9 95
11	Bee-keeping	1 40	1 40
12	Drainage	337 92	337 92
13	Maple products	2,465 79	2,465 79
14	Short courses	4,471 13	4,471 13
15	Experimental union		
16	Elementary agricultural education	2 06	2 06
17	Domestic science	6,144 80	6,144 80
18	School children's exhibits	21 26	21 26
	Totals	43,662 58	43,662 58

PROVINCE OF QUEBEC—GRANT OF 1918-19.

SUMMARY STATEMENT, April 1, 1918, to June 30, 1919—15 months.

No.	Classification.	Grant.	Expenditure.
		$ cts.	$ cts.
1	Schools of agriculture	75,000 00	75,000 00
2	School of veterinary science	5,000 00	5,000 00
3	Animal husbandry	9,000 00	9,000 00
4	Poultry	18,000 00	18,000 00
5	Horticulture and entomological work	31,000 00	31,000 00
6	Experimental and demonstration orchards	4,000 00	4,000 00
7	Dairying	5,000 00	5,000 00
8	Agricultural representatives	67,000 00	67,000 00
9	Seed selection	9,000 00	9,000 00
10	Bee-keeping	7,000 00	7,000 00
11	Drainage	6,000 00	6,000 00
12	Maple industry	4,000 00	4,000 00
13	Short courses	9,113 76	9,113 76
14	Experimental union	2,000 00	2,000 00
15	Elementary agricultural education	8,000 00	8,000 00
16	Domestic science	10,000 00	10,000 00
17	School children's exhibits	2,000 00	2,000 00
		271,113 76	271,113 76

SESSIONAL PAPER No. 15a

Macdonald College.

Statement of receipts and disbursements for year ending March 31, 1919.

April 1, 1918—Debit balance forward		$ 3,104 43
Receipts—		
Agricultural Instruction Grant		25,000 00
		$21,595 57
Disbursements—		
Animal husbandry	$3,428 86	
Biology	1,000 00	
Cereal husbandry	1,799 99	
Chemistry	583 35	
Horticulture	554 55	
Household science	3,702 31	
Poultry	3,325 58	
Veterinary science	1,500 00	
Rural school	5,811 68	
Short course	49 50	
General	1,512 89	
Demonstrator, Shawville	325 52	
		23,594 23
Debit balance, March 31		$ 1,998 66

Oka Agricultural Institute.

Expenditure of Federal Grant, 1918-19.

Enlargement of college building, annual payment		$ 5,000 00
Teaching staff, salaries and allowances		10,743 00
Administration, salaries and wages		3,352 96
Insurance, heating and lighting		2,870 64
Experimental fields		884 43
Board of students		1,900 00
Poultry	$ 100 00	
Bee-keeping	100 00	
Horticulture	200 00	
Preserving and canning	100 00	
Animal husbandry, herd improvement	1,200 00	
Student excursions to various farms	400 00	
		2,100 00
Supplies and equipment		938 17
		$28,389 20
Allocation		25,910 00
Debit balance		$ 2,479 20

School of Agriculture, Ste. Anne de la Pocatière.

Expenditure of Federal Grant, 1918-19.

Building extension, annual payment	$ 6,000 00
Salaries and allowances teaching staff	9,830 00
Insurance, heating and lighting	1,009 23
Allowance for maintenance of students	2,338 41
Poultry	200 00
Demonstration plots	500 00
Library and publications	400 00
Laboratory expenses	1,248 28
Incidentals	360 00
	$21,886 02

PROVINCE OF MANITOBA—GRANT OF 1918-1919.

SUMMARY Statement, April 1, 1918, to March 31, 1919.

No.	Classification.	Balances April 1.	Grant.	Refunds.	Total credits.	Expenditure.	Cr. balance.
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1	Agricultural representatives	7,731 84	8,113 11	.....	15,844 95	12,091 49	3,753 46
2	Dairy work	3,049 68	6,000 00	.....	9,049 68	5,184 57	3,865 11
3	Poultry work	2,152 23	5,000 00	.....	7,152 23	1,900 81	5,251 42
4	Boys' and girls' clubs	114 45	19,000 00	.....	19,114 45	13,817 29	5,297 16
5	Short courses	3,571 81	16,000 00	2,059 90	21,631 71	21,194 94	136 77
6	Home economics	301 13	15,000 00	.....	15,301 13	14,386 75	914 38
7	Soil analysis	1,000 00	1,000 00	.....	2,000 00	697 20	1,302 80
8	Beekeeping	387 19	2,000 00	.....	2,387 19	1,478 22	908 97
9	Killarney demonstration farm	213 05	4,000 00	838 25	5,051 30	4,537 82	513 48
10	Contingencies and miscellaneous	248 76	1,000 00	.....	1,248 76	1,111 37	137 39
	Totals	18,770 14	77,113 11	2,898 15	98,781 40	76,700 46	22,080 91

PROVINCE OF SASKATCHEWAN—GRANT OF 1918-1919.

SUMMARY Statement, April 1, 1918, to March 31, 1919.

No.	Classification.	Balance April 1.	Grant.	Refunds.	Total Credits.	Expenditure.	Dr. Balance.	Cr. Balance.
	College of Agriculture.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1	Staff salaries, research, etc.	6,717 22	21,476 16	.....	28,193 38	27,978 55	.....	11,214 83
2	Women's work, etc.	5,500 00	5,500 00	.....	11,000 00			
	Instruction and Demonstration.							
3	Co-operative work and marketing	197 29	6,000 00	354 64	6,551 93	6,723 13	171 20	.....
4	Animal husbandry, etc.	4,128 67	6,000 00	.....	10,128 67	4,657 62	.....	5,471 05
5	Dairying	3,745 22	6,000 00	.....	9,745 22	2,440 55	.....	7,304 67
6	Field husbandry and weed control	5,029 21	6,000 00	.....	11,029 21	8,066 20	.....	2,963 01
7	Demonstration trains	928 24	1,000 00	.....	1,928 24	921 42	.....	1,006 82
8	Agricultural representatives	10,452 66	1,476 16	.....	11,928 82	54 00	.....	11,874 82
9	Veterinary short courses	234 70	500 00	.....	734 70	.....	.....	734 70
10	Junior extension work	1,180 45	.....	.....	1,180 45	1,180 45	.....	.....
	Elementary Agricultural Education.							
11	Agricultural instruction in schools	13,946 11	25,000 00	.....	48,946 11	32,967 31	.....	15,978 80
12	School fairs	2,506 11	1,976 16	.....	4,482 27	525 20	.....	3,957 07
13	Agricultural scholarships	.....	800 00	.....	800 00	.....	.....	800 00
		64,565 88	81,728 48	354 64	146,649 00	85,514 43	171 20	61,305 77

SESSIONAL PAPER No. 15a

PROVINCE OF ALBERTA—GRANT OF 1918-1919.

SUMMARY STATEMENT, April 1, 1918, to March 31, 1919.

Number	Classification.	Balances April 1, 1918.	Grant 1918-19.	Transfers	Total Credits.	Expenditure.	Credit Balance.
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
	Schools of Agriculture.						
1	(a) Maintenance	9,439 00	35,000 00		44,439 00	43,073 67	1,365 33
	(b) Equipment	668 22	3,500 00		4,168 22	1,544 39	2,623 83
	Demonstration Farms.						
2	Maintenance	233 74	8,060 00	(1) 834 98	9,068 72	8,216 43	852 29
3	Publicity	1,765 47	2,500 00		4,265 47	2,747 81	1,517 66
4	Women's work	204 64	7,500 00		7,295 36	7,205 82	89 54
5	Agricultural representatives	2,373 44	10,000 00	(2)2,377 90	11,236 76	8,748 28	2,488 48
				(3)1,232 30			
6	Miscellaneous	919 47	465 62		1,385 09		1,385 09
	Demonstration train	Dr. 2,008 60		(3)2,008 60			
	Dairy (competition)	3,379 03					
	Dairying (special instruction)	Dr. 138 13		(3) 138 13			
	Interest	1,982 60					
		13,662 72	66,965 62	6,591 91	81,858 62	71,536 40	10,322 22
	Accrued interest from Aug. 1, '18	395 30					
		14,058 02					

(1) Transferred to demonstration farms from "Dairy Shorthorn Herd," under Agricultural Aid Account 1912-13, per authorization of March 14 and April 9, 1919 ..... $ 834 98

(2) Transferred to agriculturalrepresentatives

Balance April 1, 1918	$1,982 60	
Accrued Interest	395 30	2,377 90

(3) Dairy competition, transferred to

Dairy instruction	138 13	
Demonstration train	2,008 60	
Agricultural representatives	1,232 30	3,379 03

PROVINCE OF BRITISH COLUMBIA—GRANT OF 1918-1919.

SUMMARY Statement, April 1, 1918, to September 30, 1918.

Classification.	Balances April 1.	Grant (part).	Refunds.	Total Credits.	Expenditure.	Dr. Balance.	Cr. Balance.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Instructors and Agricultural Representatives.... Dr.	1,115 85	6,000 00	.. ..	4,884 15	5,746 81	862 66	
Field Crop Demonstration Stas. .... Dr.	647 34	3,000 00	1,268 45	3,621 09	4,847 79	1,226 70	
Horticultural Demonstration Stas	1,721 13	....	.. ....	1,721 13	1,330 33	....	390 80
Poultry.....	948 82	....	893 07	1,841 89	988 06	....	853 83
Alfalfa....	500 00	....	....	500 00	....	....	500 00
Silo Demonstrations.	767 11	....	50 00	817 11	1,408 37	591 26	
Drainage.....	775 16	....	....	775 16	....	....	775 16
Seed	3,640 47	....	589 83	4,230 30	709 76	....	3,520 54
Dairying	1,285 12	....	....	1,285 12	1,317 49	32 37	
Bee-Keeping.... Dr.	894 12	1,000 00	....	105 88	2,655 66	2,549 78	
Field Crop Competitions. Dr.	265 27	....	755 00	489 73	181 20	....	308 53
Boys' and Girls' Clubs	511 05	....	83 60	594 05	1,190 01	595 96	
Fruit Packing Schools.....	985 00	....	227 00	1,212 00	1,123 59	..	88 41
Market Work	1,249 94	....	241 66	1,491 60	341 10	....	1,150 50
Publications.	1,089 11	..	28 75	1,117 86	2,606 88	1,489 02	
Pathological and Entomological Investigations.	861 14	..	57 16	918 30	1,675 43	757 13	
Weed Investigations..	1,358 20	..	....	1,358 20	....	....	1,358 20
Elementary Agricultural Education.	3,515 72	....	....	3,515 72	....	....	3,515 72
Miscellaneous	553 51	..	....	553 51	618 27	64 76	
	16,838 90	10,000 00	4,193 90	31,032 80	26,740 75	8,169 64	12,461 69

SUMMARY Statement, October 1, 1918 to June 30, 1919.

Classification.	Balance Sept. 30.	Grant (Bal.)	Refunds.	Total Credits.	Expenditure.	Dr. Balance.	Cr. Balance.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Instructors & Representatives	776 33	4,000 00	.. ....	4,776 33	10,760 11	5,983 78	
Field Crop & Dry Farming	....	100 00 4,000 00	3,146 16	7,246 16	5,189 61	....	2,056 55
Seed Work.....	....	1,000 00	885 25	1,885 25	972 08	....	913 17
Field Crop Competition..	....	2,000 00	520 00	2,520 00	235 00	....	2,285 00
Silo Demonstrations	.....	3,000 00	....	3,000 00	1,724 84	....	1,275 16
Drainage Demonstrations....	....	500 00	46 40	546 40	.... ..	.....	546 40
Hort. Demonstration & Competitions	....	3,000 00		3,000 00	1,038 08		1,961 92
Fruit Packing & Pruning Schools	..	2,000 00	....	2,000 00	3 00	..	1,997 00
Poultry....	.....	1,000 00	1,109 29	2,109 29	2,095 58		13 71
Dairying ..	....	3,000 00	412 96	3,412 96	2,498 05	....	914 91
Bee-Keeping	.... ..	1,500 00 *1,200 00	574 10	3,324 10	3,746 16	422 06	
Boys' & Girls' Clubs	....	1,500 00	87 25	1,587 25	1,291 07	.... ..	296 18
Agricultural Journal & Publications....	.. ..	5,000	148 70	5,148 70	4,837 09		311 61
Pathological & Entomological Work..	..	3,000 00	.... ..	3,000 00	2,922 72		77 28
Miscellaneous	..	599 06	1,276 71	1,875 77	817 28	..	1,058 49
Agricultural Instruction in Schools....	3,515 72	20,000 00	..	23,515 72	20,000 00	.....	3,515 72
University of B C	.....	8,000 00	..	8,000 00	1,195 30	.....	6,804 70
	4,292 05	64,449 06	7,166 82	76 947 93	59,325 97	6,405 84	24,027 80

*Payments withheld from Grant of 1917-18.

Province of New Brunswick—Grant of 1918-1919.

Summary Statement, April 1, 1918, to March 31, 1919.

Number	Classification.	Balance April 1.	Grant.	Refunds.	Total Credits.	Expenditure.	Dr. Balance.	Cr. Balance.
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
	Agricultural Schools.							
	Equipment		500 00		500 00			500 00
	Salaries and maintenance	329 83	2,400 00	8 00	2,737 83	2,383 61		354 22
	Instruction and Demonstration.							
	Agricultural representatives	4,816 83	8,860 00		13,676 83	12,076 56		1,600 27
	Bee-keeping	103 49	2,700 00		2,803 49	2,960 91	157 42	
	Soils and drainage	321 70	3,700 00	290 57	4,312 27	4,933 50	621 23	
	Horticulture	371 72	6,000 00	284 95	6,656 67	6,394 56		262 11
	Short courses	934 96			934 96	406 50		528 46
	Live stock	622 84	6,300 00		6,922 84	7,502 13	579 29	
	Dairying	776 08	4,600 00	4 20	5,380 28	5,666 90	286 62	
	Poultry Dr.	24 67	4,300 00		4,275 33	5,234 13	958 80	
	Fertilizers	1,258 89	500 00		1,758 89	607 35		1,151 54
	Entomology	23 57	1,300 00		1,323 57	1,117 52		206 05
	Agricultural societies	1,344 92	1,600 00		2,944 92	2,985 63	40 71	
	Women's institutes	97 97	6,000 00	32 94	6,130 91	6,398 84	267 93	
	Miscellaneous Dr.	59 94	550 80		490 86	52 40		438 46
	Elementary Agricultural Education.							
	Agricultural instruction in public, high and normal schools, household science, teacher training, grants and allowances	5 85	13,000 00	84 70	13,090 55	15,443 38	2,352 83	
	School fairs		1,800 00		1,800 00	318 13		1,481 87
		10,924 04	64,110 80	705 36	75,740 20	74,482 05	5,264 83	6,522 98

Province of Prince Edward Island—Grant of 1918-1919.

Summary Statement, April 1, 1918, to March 31, 1919.

Number	Classification.	Balances April 1.	Grant.	Refunds.	Total Credits.	Expenditure	Credit Balance.
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1	Building Account	132 27	2,825 00		2,957 27	2,918 89	38 38
	Instruction and demonstration.						
1	Director and district representative	370 20	5,500 00		5,870 20	5,846 64	23 56
2	Short courses	141 96	300 00		441 96	388 65	53 31
3	Drainage and soils	298 39	1,000 00	15 00	1,313 39	1,297 90	15 49
4 5	Live stock and dairying	1 88	2,900 00	52 13	2,954 01	2,901 88	52 13
6-9	Poultry, bee-keeping, horticulture and co-operative marketing	59 45	300 00	90	360 35	340 09	20 26
10	Women's institutes	277 59	3,510 00	75 00	3,862 59	3,448 42	414 17
11	Elementary agricultural education	473 19	11,500 00		11,973 19	11,943 03	30 16
12	Miscellaneous and contingencies	350 21	3,914 22		4,264 43	2,377 54	1,886 89
		2,105 14	31,749 22	143 03	33,997 39	31,463 04	2,534 35

PROVINCE OF NOVA SCOTIA—GRANT OF 1918-1919.

SUMMARY STATEMENT, April 1, 1918, to March 31, 1919.

Number	Classification.	Balances April 1.	Grant.	Refunds.	Total credits.	Expenditure.	Dr. Balance.	Dr. Balance.
		$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
	College of Agriculture.							
	Science building—interest and sinking fund	1,786 67	8,000 00	By trans. 2,817 38	12,604 00	10,942 56	...	1,661 44
	Salaries and maintenance	16 16	23,000 00	...	23,016 16	23,016 16	...	
	Demonstration and Instruction.							
	Agricultural representatives	...	12,500 00	To trans. 28	12,500 00	13,878 43	1,378 43	
	Short courses, including maintenance of demonstration buildings and allowances to students	300 00	1,000 00	To trans. 322 21	1,300 00	1,155 59	...	144 41
	Dairying	...	4,500 00	Refund. 262 84	4,762 84	5,459 09	696 25	
				To trans. 46 81				
	Poultry	...	1,500 00	" 93 94	1,500 00	1,473 05	...	26 95
	Bee-keeping—education work	...	300 00	" 81 36	300 00	133 70	...	166 30
	Drainage demonstrations and soil surveys	...	1,800 00	" 252 88	1,800 00	1,826 00	26 00	
	Soil and fertilizer demonstr.	...	1,700 00	" 35 85	1,700 00	1,188 64	...	511 36
	Field crop demonstrations	...	1,500 00	" 192 19	1,500 00	1,479 50	...	20 50
	Fruit-growing	...	2,000 00	" 12 17	2,000 00	1,993 37	...	6 63
	Women's work-institutes and clubs, domestic science short courses and allowances	427 17	2,000 00	" 1,212 36	2,427 17	1,997 45	...	429 72
	Entomological work—investigations and education re insect pests	...	9,000 00	" 4 95	9,000 00	7,195 87	...	1,804 13
	Parliamentary Agricultural Education.							
	Agricultural instruction in public, high and normal schools, teacher training, grants and allowances	3,640 65	10,000 00	...	13,640 65	10,753 29	...	2,887 36
	School children's exhibits and competitions	120 05	2,000 00	...	2,120 05	1,298 71	...	821 34
	Contingenc. and micellaneous		916 00	To trans. 562 33	916 69	889 09	...	27 60
	Cr. bal. transferred to interest and sinking fund account	2,817 33						
		9,108 03	81,716 69		91,087 56	84,680 50	2,100 68	8,507 74

APPENDIX TO THE REPORT OF THE MINISTER OF AGRICULTURE

REPORT

OF THE

DOMINION EXPERIMENTAL FARMS

FOR THE

FISCAL YEAR ENDING MARCH 31, 1919

PRINTED BY ORDER OF PARLIAMENT

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1920

[No. 16.—1920.]

TABLE OF CONTENTS

	PAGES.
Director's Report—J. H. Grisdale, B.Agr., D.Sc.A.—including general notes and synopsis of the work on the Sub-stations	5– 15
Animal Husbandman—Report of the Dominion	16– 24
Field Husbandman—Report of the Assistant Dominion	24– 27
Horticulturist—Report of the Dominion	28– 32
Poultry Husbandman—Report of the Dominion	33– 37
Tobacco Husbandman—Report of the	37– 42
Apiarist—Report of the	42– 43
Economic Fibre Specialist—Report of the	44– 45
Chemist—Report of the Dominion	46– 57
Botanist—Report of the Acting Dominion	57– 61
Cerealist—Report of the Dominion	61– 64
Agrostologist—Report of the Dominion	65– 68
Supervisor, Illustration Stations—Report of the	68– 79
Extension and Publicity—Report of the Officer in charge	79– 80
Charlottetown, P.E.I.—Report of the Superintendent at	80– 85
Kentville, N.S.—Report of the Superintendent at	86– 93
Nappan, N.S.—Report of the Superintendent at	93–100
Fredericton, N.B.—Report of the Superintendent at	100–105
Ste. Anne de la Pocatière, Que.—Report of the Superintendent at	106–109
Cap Rouge, Que.—Report of the Superintendent at	109–125
Lennoxville, Que.—Report of the Superintendent at	126–134
Spirit Lake, Que.—Report of the Foreman-Manager at	134–135
Kapuskasing, Ont.—Report of the Foreman-Manager at	135–140
Morden, Man.—Report of the Acting Superintendent at	140–146
Brandon, Man.—Report of the Superintendent at	146–150
Indian Head, Sask.—Report of the Acting Superintendent at	151–153
Rosthern, Sask.—Report of the Superintendent at	154–157
Scott, Sask.—Report of the Acting Superintendent at	157–162
Lethbridge, Alta.—Report of the Superintendent at	162–167
Lacombe, Alta.—Report of the Assistant to the Superintendent at	167–171
Summerland, B.C.—Report of the Superintendent at	171–174
Invermere, B.C.—Report of the Superintendent at	174–186
Agassiz, B.C.—Report of the Officer in charge at	186–191
Sidney, B.C.—Report of the Superintendent at	192–196

OTTAWA, March 31, 1919.

The Honourable
The Minister of Agriculture,
Ottawa.

SIR,—I have the honour to submit herewith, for your approval, the thirty-second annual report of the work carried on by the Experimental Farms Branch of the Department of Agriculture, during the year ending March 31, 1919.

This report is merely a summary of the year's operations but an endeavour has been made to prepare it in such a way that it will be found both readable and giving a very fair general idea of the lines of activity pursued.

I have the honour to be, sir,

Your obedient servant,

J. H. GRISDALE,
Director, Dominion Experimental Farms.

ANNUAL REPORT OF THE EXPERIMENTAL FARMS

FOR THE YEAR ENDING MARCH 31, 1919

REPORT OF THE DIRECTOR

J. H. GRISDALE, B.Agr., D.Sc.A.

FIELD CROP AND LIVE-STOCK NOTES FOR 1918.

In the season of 1918, the early spring produced favourable conditions for seeding to be completed in excellent time, and the area sown to wheat, viz., 17,353,902 acres, was the largest on record.

In the West, however, May was exceptionally cold, the heavy frost retarding growth. The drought of June and July caused considerable damage, while heavy frosts from July 23 to 25 seriously affected the wheat in the blossom stage.

In the Maritime Provinces, Quebec and Ontario, conditions were generally favourable and the harvest, especially in Ontario, was good. The total value of Canada's field crops for the year was $1,367,909,970 which is again the highest on record and compares with $1,144,636,450, in 1917.

The area under root and fodder crops amounted to 12,321,351 acres as compared with 9,590,568 acres in 1917. The total estimated yield of potatoes for 1918 was 104,364,200 bushels, being much greater than the yield of 1917 and far exceeding the previous record of over 99 million bushels in 1909.

In the following tables, details are given of the yields and values of the principal field crops for 1917 and 1918. In table 3 the numbers of the various classes of live-stock in Canada are given for the period of 1914-18.

TABLE I.—Comparison of Yields and Prices obtained for the years 1917 and 1918.

Crop.	Average Yield per acre.		Average Yield per bush.		Total Yield.	
	1917.	1918.	1917.	1918.	1917.	1918.
	bush.	bush.	$	$	bush.	bush.
Fall wheat	21·50	19·00	2·08	2·08	15,533,450	7,942,800
Spring wheat	15·50	10·75	1·93	2·02	218,209,400	181,132,550
All wheat	15·75	11·00	1·94	2·02	233,742,850	189,075,350
Oats	30·25	28·75	0·69	0·78	403,009,800	426,312,500
Barley	23·00	24·50	1·08	1·00	55,057,750	77,287,240
Rye	18·25	15·25	1·62	1·49	3,857,200	8,504,400
Peas	15·25	13·25	3·54	2·54	3,026,340	3,099,400
Beans	13·75	15·50	7·45	5·41	1,274,000	3,563,380
Buckwheat	18·00	20·75	1·46	1·58	7,149,400	11,375,500
Mixed grains	32·50	38·75	1·16	1·14	16,157,080	35,662,300
Flax	6·50	5·75	2·65	3·13	5,934,900	6,055,200
Corn for husking	33·00	56·75	1·84	1·75	7,762,700	14,214,200
Potatoes	121·50	142·00	1·01	0·98	79,892,000	104,364,200
Turnips, mangels, etc.	290·75	377·50	0·46	0·43	63,451,000	122,699,600
	tons	tons	per ton	per ton	tons	tons.
Hay and clover	1·66	1·40	10·33	16·25	13,684,700	14,772,300
Fodder corn	7·34	9·50	5·14	6·15	2,690,370	4,787,500
Sugar beets	8·40	10·00	6·75	10·25	117,600	180,000
Alfalfa	2·39	2·25	11·59	17·84	262,400	446,400

TABLE 2.—Comparison of Eastern Canada, Prairie Provinces and British Columbia as to Yields and Prices obtained.

	Eastern Provinces.				Prairie Provinces.				British Columbia.			
	Average Yield per acre.		Average Price obtained.		Average Yield per acre.		Average Price obtained.		Average Yield per acre.		Average Price obtained.	
	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.	1917.	1918.
	bush.	bush.	$	$	bush.	bush.	$	$	bush.	bush.	$	$
Fall wheat	21·50	19·50	2·09	2·09	20·07	15·17	2·00	1·93	31·75	24·75	1·92	2·15
Spring wheat	18·93	20·21	2·17	2·16	15·54	10·18	1·91	2·28	28·50	22·00	2·00	2·08
Oats	30·87	37·58	0·78	0·84	29·78	23·73	0·63	0·71	53·75	39·75	0·90	1·00
Barley	27·04	33·74	1·25	1·26	21·83	20·95	1·02	0·90	29·25	26·50	1·28	1·47
Peas	15·11	12·89	3·56	2·57	17·34	19·38	3·16	1·50	23·75	21·50	2·46	3·00
Rye	17·49	16·11	1·68	1·66	18·74	15·01	1·59	1·43	....	30·00	....	2·07
Flax	10·21	11·99	3·54	3·51	6·41	5·53	2·63	3·11	....	....	....	....
Potatoes	116·70	144·49	1·09	1·02	132·86	123·43	0·80	0·80	166·55	228·00	0·69	0·97
Turnips, etc.	303·50	399·33	0·43	0·48	181·70	219·28	0·80	0·66	344·58	422·00	0·64	0·60
	tons.	tons.			tons.	tons.			tons.	tons.		
Hay and clover	1·69	1·43	10·15	16·19	1·42	0·97	10·68	14·14	1·85	1·90	17·60	33 25
Sugar beets	8·40	10·00	6·70	10·25	....	....	....	....	....	....	....	....
Fodder corn	7·74	9·73	5·00	6·01	2·82	5·57	7·66	10·50	7·00	10·10	15·00	10·00
Alfalfa	2·77	2·28	9·98	15·63	1·96	1·91	11·47	20·49	2·58	3·25	22 92	32 25

TABLE 3.—Farm and Live Stock, 1914-18.

Live Stock.	1914.	1915.	1916.	1917.	1918.
Eastern Provinces:—					
Horses	1,441,381	1,442,063	1,396,760	1,434,832	1,399,099
Milch cows	2,097,586	2,075,750	1,998,318	2,270,837	2,585,285
Other cattle	1,904,976	1,848,504	1,727,773	2,103,329	3,501,640
Sheep	1,630,714	1,569,488	1,483,065	1,840,054	2,404,319
Swine	2,357,128	2,269,029	2,096,832	2,102,506	2,842,507
Western Provinces:—					
Horses	1,445,652	1,492,681	1,800,270	1,922,793	2,166,027
Milch cows	539,998	553,152	792,797	882,441	907,350
Other cattle	1,359,464	1,450,212	1,929,844	2,423,990	2,810,462
Sheep	382,331	420,770	493,607	485,446	605,138
Swine	1,038,102	804,328	1,340,179	1,479,188	1,407,370
British Columbia:—					
Horses	60,705	61,355	61,312	55,124	44,131
Milch cows	35,702	37,944	39,318	49,005	50,965
Other cattle	99,091	100,439	103,101	191,338	195,165
Sheep	45,000	46,404	46,269	43,858	45,291
Swine	39,031	38,543	37,829	37,688	39,805

TABLE of Meteorological Observations taken at the Central Experimental Farm, Ottawa, from April 1, 1918 to March 31, 1919, giving maximum, minimum, and mean temperature for each month with date of occurrence, also the rainfall, snowfall, and total precipitation.

Months.	Maximum.	Minimum.	Range.	Mean.	Highest.	Date.	Lowest.	Date.	Rainfall.	Snowfall.	Total Precipitation.	Number of days Precipitation.	Heaviest in 24 hours.	Date.
	°	°	°	°	°		°		Ins.	Ins.	Ins.		Ins.	
April	54·28	31·56	22·71	42·91	75·0	28	17·4	19	1·41	3·00	1·41	9	0·30	18
May	68·92	45·72	23·19	57·31	85·8	19	28·0	11	1·80		1·80	11	0·53	13
June	73·51	50·08	23·43	64·79	89·8	1	36·6	20	3·13		3·13	12	1·23	12
July	81·12	58·83	22·29	69·97	96·0	22	47·0	3	3·38		3·38	16	1·42	1
August	79·14	56·04	23·10	67·59	92·0	23	43·8	18	2·92		2·92	13	0·67	13
September	62·51	45·42	17·09	53·96	80·4	2	29·8	30	5·62		5·62	21	2·31	5
October	55·42	38·84	16·58	47·13	68·0	28	27·0	8	5·17		5·17	15	1·35	6
November	41·05	28·90	12·14	34·97	52·0	9 & 10	11·2	26	2·17	3·50	2·52	15	0·89	19
December	25·75	13·60	12·15	19·67	42·6	23	— 4·8	29	1·34	20·00	3·34	17	0·60	14
January	25·15	8·81	16·33	16·97	37·2	17	—22·0	12	0·77	17·75	2·55	19	0·55	10
February	25·71	9·50	16·21	17·60	36·0	23	— 8·8	11	0 04	15·50	1·59	7	0 69	14
March	34·74	16·76	17·98	25·75	47·0	23& 26	— 7·8	14	1·78	27·50	4·53	13	1·50	9
									29·23	87·25	37·94	168		

Rain or snow fell on 168 days during the 12 months.
Heaviest rainfall in 24 hours, 2·31 inches on September 5.
Heaviest snowfall in 24 hours, 15·00 inches on March 9.
The highest temperature during the 12 months was, 96·0° on July 27.
The lowest temperature during the 12 months was 22·0° on January 12.
During the growing season rain fell on 9 days in April, 11 days in May, 12 days in June, 16 days in July 13 days in August, and 21 days in September.
February shows the lowest number of days with precipitation, viz. 7.
Total precipitation during the 12 months, 37·94 inches, as compared with, 32·48 inches during 1917-18.

RAINFALL, Snowfall, and total Precipitation from 1890 to 1918-19, also the average annual amount that has fallen.

Years.	Rainfall.	Snowfall.	Total Precipitation.
1890	24·73	64·85	31·22
1891	30·19	73·50	37·54
1892	23·78	105·00	34·28
1893	31·79	72·50	39·04
1894	23·05	71·50	30·20
1895	27·01	87·50	35·76
1896	21·53	99·75	31·50
1897	24·18	89·00	33·08
1898	24·75	112·25	35·97
1899	33·86	77·25	41·63
1900	29·48	108·00	40·72
1901	29·21	97·25	38·91
1902	25·94	101·75	36·10
9903	26·43	85·00	34·92
1904	25·95	108·75	36·79
1905	23·71	87·25	32·42
1906, January 1 to March 31	1·90	24·50	4·34
1106-07	21·73	72·50	28·94
1907-08	24·70	134·75	38·18
1908-09	22·13	107·90	32·91
1909-10	28·40	61·25	34·51
1910-11	18·94	88·25	27·72
1911-12	20·12	98·50	29·95
1912-13	32·54	106·50	43·18
1913-14	21·51	70·25	28·51
1914-15	16·77	78·50	24·67
1915-16	22·66	130·00	35·65
1916-17	24·84	126·50	37·18
1917-18	20·90	116·00	32·48
1918-19	29·23	87·25	37·94
Total for 29 years and 3 months	731·96	2,743·75	1,006·24
Average for 29 years	25·24	94·61	34·69

RECORD of Sunshine at the Central Experimental Farm, Ottawa, from April 1, 1918 to March 31, 1919.

Months.	Number of days with Sunshine.	Number of days without Sunshine.	Total hours Sunshine.	Average Sunshine per day.
April	26	4	244·0	8·13
May	30	1	227·7	7·34
June	29	1	293·0	9·76
July	30	1	283·4	9·14
August	30	1	279·1	9·00
September	26	4	149·6	4·98
October	23	8	134·1	4·32
November	21	9	80·5	2·68
December	19	12	90·9	2·93
January	21	10	86·7	2·79
February	25	3	138·4	4·94
March	21	10	148·3	4·78

Signed.

WILLIAM T. ELLIS,
Observer.

DISTRIBUTION OF SAMPLES.

The distribution of samples of seed grain, potatoes, flower-seeds, fruit trees and shrubs was again carried on during the past winter from the Central Farm at Ottawa and from the various branch Farms and Stations. The distribution of seed grain was made from Ottawa and of seed grain and potatoes from the branch Farms and Stations.

EXPERIMENTS AT FORT VERMILION, ALTA.

Character of season.—During the month of March the temperature, for the most part, kept well below the zero point. Throughout the month of April, as well, the severe weather prevented any farm operations.

Although some wheat was sown on May 4, seeding commenced in general only on the 8th. On account of the land being so cold, germination was very slow, while a frost about the middle of the month nipped the sprouted grain and set back the vegetables considerably.

The first half of June was very dry, which, along with the snow and frost, resulted in a slow growth throughout the month. Potatoes, however, were doing nicely by the end of the month.

July set in somewhat dry but an unexpected frost on the 20th seriously affected nearly all crops, so much so that many fields of wheat, oats and barley were cut as green feed.

The only real growth made by the root crops and vegetables was in August. The first barley was cut on August 3, oats on the 5th, and Prelude wheat on the 12th.

September throughout was a very fine month enabling the farmers to rush along the harvesting operations, all grain being either threshed or stacked and root crops and potatoes completely harvested by the 25th. A very severe frost of 18° on the 8th stopped all growth.

Cereals.—Seven varieties of wheat tested ranged in yield from Bishop, 66 bushels per acre to Prelude, 34 bushels. Seven varieties of oats yielded from 130 bushels, 20 pounds of Garton's Regenerated Abundance to 79 bushels, 24 pounds of Eighty-Day. Five varieties of six-rowed barley yielded from 60 bushels of Manchurian to 41 bushels, 22 pounds of Success, while the two-rowed variety, Canadian Thorpe, yielded 53 bushels, 36 pounds. Spring rye yielded 49 bushels, 16 pounds per acre, and Fall rye, 36 bushels, 24 pounds. Owing to the severe frosts and unfavourable weather conditions, the yield of peas was very much lower than usual. The Arthur variety yielded 26 bushels per acre and the Prussian Blue, 28 bushels. Flax, although not a common crop in this section of Peace River, gave 1 ton, 1,200 pounds of straw per acre.

Forage crops.—The season of 1918 was rather unfavourable for forage crops at this Station. Not until well towards the end of July did the roots get a real start, most of the growth being made during August. Owing to the alternate freezing and thawing in April, the Meadow fescue suffered a serious set-back, yielding 1 ton, 1,760 pounds per acre for hay production, and a plot, sown for seed, yielded 360 pounds per acre. Alfalfa yielded from 1 ton, 1,420 pounds per acre to 1 ton, 1,030 pounds. Red clover yielded 1 ton, 1,750 pounds per acre and Alsike, 1 ton, 1,450 pounds. Three plots of millet yielded as follows: Siberian, 1 ton, 1,000 pounds, Japanese, 1 ton, 300 pounds, and Common Millet, 1 ton, 1,500 pounds. Brome grass yielded 2 tons, 400 pounds per acre, Timothy, 1 ton, 1,000 pounds, Red Top, 1 ton, 1,100 pounds, and rye-grass 2 tons, 200 pounds, in each case the hay being of fine quality and medium length. Four varieties of field carrots tested, yielded as follows: Ontario Champion, 11 tons, 500 pounds per acre, White Belgian, 14 tons, 1,880 pounds, Improved Short White, 12 tons, 60 pounds, and

Large White Vosges, 12 tons, 1,500 pounds. Of the five varieties of mangels tested, the yields ranged from Royal Giant, at 16 tons, 1,420 pounds per acre, to Prize Mammoth Long Red at 12 tons. Turnips, three varieties, yielded as follows: Perfection Swede, 16 tons, 1,900 pounds per acre, Hartley's Bronze Top, 23 tons, 1,100 pounds, and Good Luck, 17 tons, 800 pounds, while fall turnips, two varieties, yielded 31 tons, 1,130 pounds of Purple Top Yellow Aberdeen, and 27 tons, 1,600 pounds of White Globe. Only one variety of sugar beets was under test this season, the French Very Rich, yielding 9 tons, 600 pounds per acre.

The flowers, both annual and perennial, had only a short period in which they were in bloom but during that time they made a very fine showing.

TABLE of Meteorological Observations taken at Fort Vermilion, Peace River District, Alberta, from April 1, 1918, to March 31, 1919, showing maximum, minimum, and mean temperature, the highest and lowest for each month with date of occurrence, also rainfall, snowfall, and total precipitation.

Months.	Maximum.	Minimum.	Range.	Mean.	Highest.	Date.	Lowest.	Date.	Rainfall.	Snowfall.	Total Precipitation.	Number of days Precipitation.	Heaviest in 24 hours.	Date.
	°	°	°	°	°		°							
April	44·80	12·95	31·85	28·87	58·9	30	−11·5	7	.....	0·50	0·05	1	0·05	5
May	52·85	26·49	26·36	39·67	69·0	29	11·5	16	0·20	3·00	1·27	7	0·56	1
June	67·82	36·39	31·43	52·10	81·0	18	16·0	2	1·21	..	1·21	7	0·37	11
July	70·76	37·80	33·95	54·77	88·9	17	20·0	24	1·26	...	1·26	7	0·38	5
August	69·69	39·88	29·80	54·78	83·9	16	33·0	25	2·77	..	2·77	15	1·45	17
September	65·38	27·76	37·62	46·57	79·0	5	14·0	8	0·02		0·02	1	0·02	7
October	41·41	13·28	28·13	27·34	66·0	4	−15·5	30	0·08	14·75	1·55	5	1·00	20
November	22·98	− 3·31	19·67	6·52	45·5	1	−23·5	16	.. ..	7·50	0·75	5	0·40	29
December	10·76	−17·52	28·29	− 3·38	37·0	25	−40·0	14		1·25	0·12	2	0·10	11
January	13·85	−16·21	30·38	− 1·02	47·9	9	−38·0	20	.. ..	1·50	0·15	3	0·05	18
February	4·36	−26·27	30·63	−10·96	26·5	13&20	−64·5	25	..	2·25	0·22	2	0·20	17
March	12·28	−24·85	37·13	− 6·29	46·5	22	−48·9	13	.. ..	1·00	0·09	3	0·05	14
	.....	.....	.....	.....	.....	.....	.....	..	5·54	31·75	9·46	58		

SESSIONAL PAPER No. 16

Some Weather Observations taken at Central Experimental Farm, Ottawa, as compared with those taken at Fort Vermilion, Peace River District, Alberta.

——	Mean Temperature.	Highest Temperature.	Lowest Temperature.	Total Precipitation.	Heaviest in 24 hours.	Total hours Sunshine.	Average Sunshine per day.
April.	°	°	°	Ins.	Ins.	Hrs.	Hrs.
Ottawa	42·91	75·0	17·4	1·41	0·30	244·0	8·13
Fort Vermilion	28·87	58·9	−11·5	0·05	0·05	236·0	7·86
May.							
Ottawa	57·31	85·8	28·0	1·80	0·53	227·7	7·34
Fort Vermilion	39·67	69·0	11·5	1·27	0·56	226·3	7·30
June.							
Ottawa	61·79	89·8	36·6	3·13	1·23	293·0	9·76
Fort Vermilion	52·10	81·0	16·0	1·21	0·37	263·8	8·78
July.							
Ottawa	69·97	96·0	47·0	3·38	1·42	283·4	9·14
Fort Vermilion	54·77	88·9	20·0	1·26	0·38	320·0	10·32
August.							
Ottawa	67·59	92·0	43·8	2·92	0·67	279·1	9·00
Fort Vermilion	54·78	83·9	33·0	2·77	1·45	249·0	8·03
September.							
Ottawa	53·96	80·4	29·8	5·62	2·31	149·6	4·98
Fort Vermilion	46·57	79·0	14·0	0·02	0·02	285·6	9·52
October.							
Ottawa	47·13	68·0	27·0	5·17	1·35	134·1	4·32
Fort Vermilion	27·34	66·0	−15·5	1·55	1·00	136·0	4·38
November.							
Ottawa	34·97	52·0	11·2	2·52	0·89	80·5	2·68
Fort Vermilion	6·52	45·5	−23·5	0·75	0·40	66·7	2·22
December.							
Ottawa	19·67	42·6	− 4·8	3·34	0·60	90·9	2·93
Fort Vermilion	−3·38	37·0	−40·0	0·12	0·10	42·6	1·37
January.							
Ottawa	16·97	37·2	−22·0	2·53	0·55	86·7	2·79
Fort Vermilion	−1·02	47·9	−38·0	0·15	0·05	56·2	1·81
February.							
Ottawa	17·60	36·0	−8·8	1·59	0·65	138·4	4·94
Fort Vermilion	−10·96	26·5	−64·5	0·22	0·20	119·1	4·25
March.							
Ottawa	25·75	47·0	−·78	4·53	1·50	148·3	4·78
Fort Vermilion	−6·29	46·5	−48·9	0·09	0·05	194·0	6·25

Record of Sunshine at Fort Vermilion, Peace River District, Alberta, from April 1, 1918, to March 31, 1919.

Months.	Number of days with sunshine.	Number of days without sunshine.	Total hours sunshine.	Average sunshine per day.
April	28	2	236·0	7·86
May	28	3	226·3	7·30
June	29	1	263·8	8·78
July	30	1	320·0	10·32
August	29	2	249·0	8·03
September	30	0	285·6	9·52
October	21	10	136·0	4·38
November	20	10	66·7	2·22
December	15	16	42·6	1·37
January	15	16	56·2	1·81
February	22	6	119·1	4·25
March	30	1	194·0	6·25

EXPERIMENTS AT GROUARD, ALTA.

Owing to the coldness of the weather extending into late spring, seeding operations could not be commenced until the first of May. The crops continued to develop rapidly and had made excellent growth when they were injured by the severe frost on the 23rd and 24th of July. This seriously affected the grain crops which were late in being sown, and while the remainder of the crops were not abundant in their yields, yet the results were passable.

Three varieties of spring wheat, Prelude, Marquis and Huron, up to the July frost, had attained a height of 48 inches, 45½ inches and 52 inches respectively; Victory oats attained a height of 41 inches, Banner, 37 inches and Daubeny, 48 inches; Manchurian barley, a height of 51 inches and Success, 48 inches; Fall rye, a height of 72 inches when it, too, was set back by the frost.

As with the grain crops, the vegetables, at the time of the July frost, had an excellent appearance, exceeding anything in previous years, the seeds having been sown in hot beds the first of April. Cabbage, celery, tomatoes, cucumbers, squash, melons, beans, beets, carrots, corn, onions, peas, parsley, parsnip, radishes, turnips and lettuce, although very seriously injured by the frost, and subjected to the ravages of the white grub, gave fair results. Forage plants such as brome-grass, red top, timothy, alfalfa, red clover and alsike do not seem to give satisfaction, very few plants surviving and possibly nearly all will have disappeared by next spring.

EXPERIMENTS AT BEAVERLODGE, ALTA.

The season of 1918 proved a very unusual one. A late spring followed by a very cold, dry, frosty May, general throughout the West in 1918, was most unfavourable for the starting of garden seeds. The weather, however, was extraordinarily favourable for grasses and clovers, being, for the most part, warm with frequent showers from the 1st of June to late summer. The mid-summer frost, occurring on July 22 and 23, when most of the grain was heading out, was most disastrous to the finest grain-crop prospect in the history of Grande Prairie.

Three varieties of wheat were again tested, with the new wheat, Ruby, for initial trial. Of these, Huron again headed the list at 40 bushels per acre outyielding Marquis at 28 bushels, 41 pounds and followed by Ruby at 23 bushels, 30 pounds and Prelude at 12 bushels, 8 pounds per acre. Of the five varieties of oats tested, three of them having been compared for three years, Ligowo yielded 122 bushels, 15 pounds, Victory 101 bushels, 3 pounds, Daubeny, 101 bushels, Abundance, 111 bushels, 24 pounds,

and Liberty O., 79 bushels, 14 pounds per acre. Three varieties of barley, compared also for the third season, gave O.A.C. No. 21, 7 bushels, 9 pounds, Early Chevalier, 19 bushels, 20 pounds, and Manchurian, 2 bushels, 9 pounds. Two varieties of rye yielded from 57 bushels, 32 pounds to 39 bushels, 36 pounds. Flax was tried for the first time, the variety Premost yielding 16 bushels, 4 pounds per acre.

Work with forage crops in 1918 comprehended a fairly extensive seeding with grasses and legumes, besides specimen plots in duplicate of field roots and several kinds of annual crops such as millet and rape. Experiments were carried on with grasses and leguminous haycrops regarding best varieties, economic seeding, thickness of growing and method of culture. In 1916 duplicate grass and clover plots were sown, the total yielded per acre of cured hay from the two years' crops being as follows: Western Rye grass, 5 tons, 1,558 pounds, Timothy, 3 tons, 325 pounds, Meadow Fescue, 3 tons, 91 pounds, Red Alfalfa, 2 tons, 1,389 pounds, Alsike, 2 tons, 1,243 pounds, and Red Clover, 2 tons, 220 pounds. In field roots, the Improved Short White carrots yielded 11 tons, 1,338 pounds per acre, Klein Wanzleben sugar beets, 10 tons, 40 pounds, Yellow Intermediate mangels, 13 tons, 360 pounds, and Canadian Gem turnips, 21 tons, 540 pounds.

In horticulture, the cold, dry spring somewhat retarded the germination of many of the less hardy vegetables. From the end of May, however, the weather was so favourable as to permit the early seedings to advance and they developed rapidly and, save for the areas devastated by the July frost, the garden presented a very attractive appearance. The season taught a very important lesson regarding methods of preventing injury by frost. Seven varieties of potatoes were tested, the yields varying from Early Northern at 231 bushels, 4 pounds per acre, and Early Rose at 217 bushels, 13 pounds to Irish Cobbler at 127 bushels, 26 pounds and Wee McGregor at 121 bushels, 30 pounds. A fairly accurate, comparative experiment was conducted regarding the time of planting potatoes, showing that those planted the earliest, April 27, yielded 412 bushels, 54 pounds per acre, compared with May 17, 208 bushels, 43 pounds, and June 7, 173 bushels, 53 pounds. The garden peas, beans, asparagus, beets, cabbage, celery, etc., gave creditable results, but the corn, cucumbers and melons were frozen in July.

The smaller fruits, apple trees and ornamental shrubs made a good showing considering the unusual season.

TABLE of Meteorological Observations taken at Beaverlodge, Grande Prairie, Alberta, from April 1, 1918, to March 31, 1919, giving the maximum, minimum, and mean temperature for each month, also rainfall, snowfall, and total precipitation.

Months.	Maximum.	Minimum.	Range.	Mean.	Highest.	Date.	Lowest.	Date.	Rainfall.	Snowfall.	Total precipitation	Number of days precipitation	Heaviest in 24 hours.	Date.
	°	°	°	°	°		°							
April	49·60	26·46	23·13	38·02	65·0	30	3·0	2	0·20	4·00	0·60	1	0·60	24
May	58·06	33·09	24·96	45·57	76·0	28	22·0	16	0·19	*0 03	0·22	3	0·19	31
June	65·00	42·66	22·33	53·82	78·0	21	30 0	5	1·70		1·70	11	0·62	14
July	69·04	46·24	22·80	57·64	89·0	17	29 0	23	2·66		2·66	14	0·64	20
August	67·51	46·35	21·16	56·93	75·0	16	35 0	27	1·71		1·71	8	0·84	31
September	66·83	39·55	27·28	53·19	78 0	5 & 18	25·0	30	0·42		0·42	3	0·33	22
October	47 48	27·32	20·16	37·40	66·0	3	10 0	23&26	0·80	1·75	0·97	8	0·25	20
November	34·60	18·73	15·86	26·66	54·0	6	− 1·0	22		5·50	0·55	3	0·30	28
December	27·54	10·58	16·96	19 06	43·0	1	−17·0	30		11·00	1·10	4	0·60	28
January	29 93	14·29	15·64	22·11	46·0	8 & 9	−14·0	18		6·50	0·65	4	0·30	17
February	16·42	−1·10	17·53	7·66	38 0	19	−31·0	25		7·00	0·70	5	0·20	21
March	20·16	0·32	19·83	10·23	47·0	31	−34·0	1		19·50	1·95	7	1·00	17
Total									7·68	55·28	13·23	71		

*Melted snow.

EXPERIMENTS AT FORTS SMITH, RESOLUTION AND PROVIDENCE, NORTHWEST TERRITORIES.

FORT SMITH.

After a very severe winter, during which there was an unusual amount of snow, it was not until nearly the end of May that seeding operations were begun. Fortunately there were in hot beds vigorous young plants of cabbage, onions, radish and lettuce, so that as soon as the ground was sufficiently warm, all seeds were sown. In less than three weeks germination was complete, the seeds sprouting satisfactorily. The summer being somewhat cold, the plants suffered considerably and were stunted in their growth.

Copenhagan Market cabbages attained a weight of from 4 to 6 pounds while Kildonan ranged from 6 to 10 pounds. Of the four varieties of onions planted, viz., Yellowglobe, Wethersfield Red, Prizetaker and White Barletta, the Prizetaker, though being later than the rest, far exceeded in size. Two varieties of red carrots, the Chantenay and the Gueranda sowed the previous autumn, gave better results than the two varieties of white, the Blanche des Vosges and the Collets Verts sowed in the spring, exceeding the latter varieties by a difference of one-half pound in the weight of the carrot. Two varieties of beets were tested, the Eclipse giving almost equal results to the Detroit Red. The root crops, without exception, were seriously attacked by worms, an efficient remedy for which it was almost impossible to obtain. Similar results to the above were obtained from the various tests on the St. Bruno farm, 20 miles from Fort Smith.

FORT RESOLUTION.

Although there was a considerable amount of work done in connection with improving the land and with soil drainage, yet the season was one of the most unfavourable for the growth of crops. A late spring followed by unusual cold in the months of June and July seriously retarded development. About the middle of July a heavy frost almost completely destroyed the potato crop, which, along with the fact that the cabbages, beets and root crops were attacked by worms, resulted in a poor showing. Owing to the cereals not having ripened last year, there was a noticeable shortage of seed, the soil of the plots also being quite inferior. Considerable work was done in the culture of hot beds, which, notwithstanding the unfavourable season, the cold and drought, the worms and insects, gave excellent satisfaction this year. The hay crop was short and light and is not comparable with that of previous seasons.

Two varieties of barley, one from the Central Farm and the other from Fort Providence, did not attain to the same results as in previous years. Potatoes, having been injured by the frost, produced a poor crop, 80 bags yielding only 180 bags. Peas, of which eight varieties were tested, were also cut down by the frost. Turnips, considering the weather conditions, gave fair yields, the average weighing from 4 to 5 pounds, and some reaching even 7 pounds. Beets and carrots, coming up too late to develop sufficiently, gave only inferior returns.

FORT PROVIDENCE.

The spring of 1918 was late and cold weather continued on into early summer. As a result, the principal crop grown in the district—potatoes— was very light and the tubers poorly developed. Vegetables such as carrots, turnips, beets, cabbage, and cauliflower succeeded very well, as did barley, wheat, oats and peas. Considerable damage from insect pests occurred during the season.

EXPERIMENTS AT SALMON ARM, B.C.

The spring opened with cool weather and light showers in April and the first half of May, enabling the potatoes and grains to make rapid growth. Dry weather with warm winds from the middle of May till July caused wheat and oats to ripen too rapidly, lowering the yield.

Considerable damage was caused by cut-worms which attacked the early-sown roots, just as soon as the plants appeared above the ground, thus making the root crop unusually light. The hay was light, while the drying winds killed the young, tender plants of the clover. The dry season was an advantage, however, in that the fruits were free from scab and fungus diseases and a very satisfactory price was realized from the apples, most of which graded No. 1. An interesting experiment was conducted with regards to comparison of different varieties of root seed, the plants of which, in some cases, went largely to seed instead of developing properly.

Meteorological record at Salmon Arm for the year ending March 31, 1919.

—	Highest Temperature.	Date.	Lowest Temperature.	Date.	Rainfall.	Snowfall.	Sunshine.	
1918					Inches.	Inches.	Hrs.	Min.
April	77	30	21	3	0·35	.....	248	24
May	79	12–14	31	26	0·62		223	54
June	88	12	34	3	1·46		287	30
July	99	17	44	3–25	0·79		272	42
August	93	24	42	28	2·81		222	42
September	81	12	40	25	0·21		282	18
October	69	5–6–21	31	25–30	2·56		98	24
November	52	2	15	24	1·42	6½	50	36
December	44	4	4	31	0·20	16	36	42
1919.								
January	44	23	9	1	1·17	11¾	28	12
February	41	17	−4	24	0·25	20½	52	30
March	64	28	−4	1	0·06	17	122	6
Totals	.....		.....		11·90	71¼	1,926	00

EXPERIMENTS AT SWEDE CREEK, DAWSON CITY, Y.T.

Several varieties of alfalfa were tested to ascertain which was most suitable to withstand the severe winters of this territory. All varieties, however, gave a fairly average yield. The plots of red clover and alsike also had good growth and fairly good yields. Timothy and a small percentage of alsike yielded at the rate of 2½ tons per acre.

Of the wheat sown, Huron yielded 45⅜ bushels per acre, Prelude, 21⅜ bushels, and Marquis, 38 bushels. Banner oats yielded 77⅜ bushels per acre, Victory, 54⅜, and Daubeney, 37⅜ bushels. Manchurian barley gave 28⅜ bushels per acre.

In the root crops, several varieties of mangels, carrots and turnips were tested with a view to ascertain the effect of fertilizer. There was no noticeable difference in mangels and carrots, but the turnips, where the fertilizer was used, were superior in quality and quantity.

The garden vegetables did extremely well with the exception of carrots, beets, parsnips and onions which were planted on higher ground and did not receive so much moisture. Operations with fertilizers were conducted, in an effort towards soil improvement.

DIVISION OF ANIMAL HUSBANDRY.

REPORT OF THE DOMINION ANIMAL HUSBANDMAN.
E. S. ARCHIBALD, B.A., B.S.A.

The live stock work during the past year at the Central Experimental Farm has made rapid progress. Conditions as to housing and general management of the stock were excellent. The abundant supply of ensilage, green feed and hay, and the excellent quality of pasture during the summer, maintained the production of the stock and the growth of young stock in spite of the great scarcity, high prices and low grades of grains and meals. The scarcity of sufficient areas of pasture continued to be a handicap to greatest progress in either breeding or experimental work.

There are now 690 head of live stock in the stables, made up as follows:—195 dairy cattle, 32 horses, 184 sheep and 279 swine.

All the live stock made a good showing during the past year. Again every effort was made to assist in the movement for greater production of animals and animal products. Practical problems of an immediate nature were given precedence over other lines of experimental and demonstrational work. The more important of these are enumerated herewith.

All branches of the live stock work made a satisfactory financial showing during the past year in spite of many experiments in feeding, many of which proved to be inferior to good commercial methods. The sales of dairy products amounted to $12,417.68, and the total sales of live stock $21,963.01. The various herds and flocks have increased in value $10,135. These, coupled with the value of horse labour supplied other Divisions, manure supplied other Divisions and feeds on hand, showed a gross turnover of $62,500.89, of which the net profit was $2,136.93. Considering the very moderate valuations placed on stock on hand, labour supplied, etc., and the high prices of feeds and labour purchased, and the large amount of experimental work done, this is a most creditable showing.

HORSES.

The horses on this Farm are mostly of the draught type, excepting the necessary drivers and express horses. With the exception of two tractors which are used experimentally, the horses do all the labour in power and transportation for all the divisions on this Farm. At present there are 32 horses, which include 25 draught horses and colts, 4 expressers and 3 drivers. The heavy draught horses include several excellent Clydesdale mares.

Breeding operations with the horses were not very successful during the year owing to the poor quality of stallions available for use in the previous season. However, there is excellent promise for progress during the coming year.

Experimental work along the lines of feeding was not continued during the year, but other experiments in rearing of young stock, the use of vaccines as a prevention of joint-ill, etc., were continued with satisfactory results.

The horses have increased in value during the year only to a slight extent, namely, $240. That this was the hardest year on our horses may be seen in the increased amount of horse labour supplied. During the year the horse labour amounted to 8,188 days, which at the low value of 70 cents per day amounts to $5,731.60. Had horse labour been valued at even as low a figure as $1 per day this department would have shown a net profit of over $1,700, whereas it just failed to meet all the extra heavy charges of feed, labour, shoeing, harness repairs, purchases, etc.

BEEF CATTLE.

Due to limited facilities, no breeding beef cattle work is conducted on this Farm, and beef operations are, of necessity, limited to winter steer finishing.

During the past winter three carloads of steers were finished for market. These steers were purchased during the month of October and were put on excellent pasture after dehorning. However, the extremely wet weather of the following six weeks caused a heavy shrinkage in spite of the excellent feed available. The objects of this winter experiment were as follows:—

1. To discover the possible profits in finishing steers under present market conditions of feeds and finished beef animals.

2. To compare breeds of steers for winter finishing.

3. To compare finishing in cheap open-front sheds with steers finished in warm barns.

4. To compare medium grain feeding from the start with light grain finishing during the last ten weeks of feeding.

The weather of the past winter was particularly mild and when the yards were not too muddy these mild conditions were most favourable toward shed feeding. However, in spite of the handicap of muddy yards, all steers made excellent gains and a fair profit in spite of high initial cost, heavy shrinkage on fall pasture and high prices of feeds. During the feeding period of 134 days the steers showed a net profit of $765 on the lot over and above all items of expense, including 6 per cent interest on investment.

General Conclusions from Experiment.

1. These conclusions are the result of only one year's experiment and must be taken as such, due allowance being made for individuals.

2. The late pastures of fall, if accompanied by heavy rainfall and raw, cloudy weather, will cause heavy shrinkage in steers, even though the grass is excellent.

3. Light grain finishing produces greatest profit per steer.

4. Feeding steers outside with a rough shed for sleeping shelter is very satisfactory, excepting when yards are soft in fall and spring, at which time gains will be slow and expensive.

5. Steers fed in the barn the same as in open sheds where special provision is not made for drainage and freedom from mud show marked advantage for inside feeding to the extent of 21 per cent greater daily gains, 18 per cent less cost per pound gain and considerably less feed per pound gain. However, the stable feeding is accompanied by more labour and a heavy overhead building charge, which more than offset the difference.

6. With better yards for shed feeding, there would be practically no difference in daily gains or cost per pound gain.

7. It pays to start the grain ration for winter finished steers very lightly and at a comparatively late date, thus increasing the grain at the time of warmer weather in late winter and early spring when greatest gains are thus made.

8. The lower standing of the Angus in the above experiment should not be taken as a criterion, as these animals were younger, finer, and many much nearer the finish than those of other breeds.

9. The Herefords were in the best condition throughout the experiment, were worth the most at all times, but being heavier-fleshed probably explains the lower gains than made by the Shorthorns.

10. The Shorthorns, good-framed steers but thinner than the Herefords, made greatest daily gains, greatest profits per steer, and at the least cost per pound gain.

11. There is more difference between animals within the breeds of this experiment than between the breeds themselves. This is seen particularly in comparing the Angus of Lot I vs. Lot II, or of the Shorthorns and Herefords in Lot I vs. Lots II or III.

12. Finish steers during the winter for the Easter markets in order to make greatest profits. The following requirements:—

a. Steers in thrifty condition but thin rather than near the finish will make greatest gains and profits.

b. The quarters for wintering steers should not be governed by temperature as much as dry footing and freedom from mud.

c. Light grain feeding is most profitable and generally speaking, with good feeding steers, no grain is needed before January; grade increase of grain ration from 2 to 10 pounds, the maximum of 10 pounds would be held for about one month previous to marketing.

DAIRY CATTLE.

Four pure-bred and two grade herds are still maintained, namely: Ayrshire, 64 head; French Canadian, 20 head; Holstein, 49 head; Jerseys, 30 head; grade Ayrshire, 14 head; grade Holstein, 18 head. This total of 195 head of dairy cattle of all breeds and ages is an increase of 8 head over a year ago and is the greatest number of dairy cattle ever maintained on this Farm. The health of the herd has been excellent throughout the year and the production records have been equally satisfactory. A few unfortunate losses during the year, including the Holstein herd sire, due to accidents, and the high cost of replacing such animals, do not leave a net profit with this branch proportionate to other classes of stock. In addition to this the fact that butter was manufactured largely throughout the year caused a decrease in the revenue of at least $3,000 as compared with the smaller amount of labour and the greater cash returns for milk if sold as such to the city trade at ruling prices.

Dairy Cattle Experiments.—The following lines of work have been inaugurated and maintained during the year:—

The completion of the series of experiments on green feed vs. ensilage as a pasture supplement showed results uniform with those of previous years. The ensilage is not only cheaper feed in itself but has an added advantage in the saving of labour. The difference in feed cost alone of producing 100 pounds of milk was over 20 cents per hundredweight.

A new feed now commonly found on Canadian markets, namely—Palm Nut Cake Meal—was experimented with and proved eminently satisfactory. The results of this trial were responsible for considerable quantities being introduced into Canada to alleviate the shortage of other feeds.

Several other materials thought of possible value for feeding of dairy cattle were tried, but none proved satisfactory owing to chemical or physical properties. Most notable amongst these was an attempt to use coffee bran as a cattle feed.

Careful data were again collected on the cost of rearing young stock of all breeds and sexes to various ages. These animals were fed on various farm roughages, and where grains or meals were required, the cheapest possible materials available were used.

During the winter a special study was made of several compounded dairy meals commonly found on our markets and which were being greatly advertised and sold during the period when meals were exceedingly scarce. This experiment has not been completed, consequently the definite results of the experiment cannot be given.

The continued study of the various makes of milking machines has made satisfactory progress during the year. Two more new makes of milkers, notable amongst which is the McCartney milker, were installed.

The careful study of contagious abortion in cattle was continued. The work with serums and vaccines as a preventive was continued by the Health of Animals Branch, several types of vaccine being used. Although not definite in character the results are exceedingly promising.

Dairy Cattle Returns.—The following table shows production somewhat lower per cow than during previous years, which however, is accounted for by the high percentage of heifers which finished their lactation periods and are included in this report, and also owing to the fact that many of the best cows in the herd had not completed their lactation period during the year.

AVERAGES.

Number of Head.	Breed.	Age.	Average days in milk.	Average lbs. milk produced.	Average per cent fat in milk.	Average profit over cost of feed between calvings. Labour, manure and calf, etc., not included.
61.	All breeds and ages	5	312	7,755·8	3·89	$86·10
5 Best	Ayrshire	7	314	8,075·7	3·66	$81·91
10 Total herd	"	6	267	6,554·0	3·61	$63·00
5 Best	Fr. Canadian	5	351	7,686·4	4·74	$112·63
5 Total herd	"	5	351	7,686·4	4·74	$112·63
5 Best	Holstein	5	350	14,255·2	3·38	$146·53
18 Total herd	"	5	319	10,400·0	3·45	$103·82
5 Best	Jerseys	5	367	7,508·2	5·26	$120·46
15 Total herd	"	4	337	5,672·7	5·04	$79·58
4 Best	Grade Ayrshire	7	311	6,988·1	3·64	$75·36
4 Total herd	"	7	311	6,988·1	3·64	$75·36
5 Best	Grade Holstein	7	300	8,779·8	3·53	$88·95
9 Total herd	"	6	291	7,654·6	3·25	$75·69

Official Records.—In spite of the labour shortage and the great shortage of feeds, and especially high grade feeds, a few cows were again entered in official records, which, under very average commercial conditions, made the following very creditable records:—

RECORD of Merit Tests on Central Farm, April 1, 1918, to March 31, 1919.

Name and Number of Cow.	Age at Commencement of test			Number Days on Test.	Pounds Milk.	Pounds Fat.	Pounds 80% Butter.
	Years.	Months.	Days.				
Boutsje de Boer Posch 3rd 44452	2	4	17	7	323·5	10·30	12·89
" " "	2	4	17	30	1,290·5	41·86	52·33
Canaan Beauty 2nd 21172	6	3	14	7	641·0	18·84	23·55
" " " "	6	3	14	30	2,698·4	74·86	93·57
Helena Keyes Posch 21376	6	8	23	7	690·0	22·57	28·22
" " "	6	8	23	30	3,059·5	93·05	116·32
Jewel Belle Dewdrop 2nd 20244	7	10	9	7	448·	15·73	19·66
" " "	7	10	9	14	831·	30·25	37·82
Ottawa Woodcrest Lyn 44975	2	1	13	7	317·5	12·38	15·35
Ormsby Bessie Ann 43407	2	6	24	7	402·5	13·75	17·19
" " " "	2	6	24	14	795·	26·25	33·32
Ottawa March Ormsby 36769	3	5	22	7	466·	17·41	21·77
" " "	3	5	22	30	1,857·5	70·01	87·52
Ottawa Pietertje Ormsby 44451	2	3	16	7	393·	15·19	19·00
" " "	2	3	16	30	1,647·5	61·83	77·30

CANADIAN RECORD of Performance, April 1, 1918, to March 31, 1919.

Name and Number of Cow.	Breed.	Age at Commencement of test.	No. Days Milking.	Pounds of Milk produced.	Pounds of Fat produced	Average per cent Fat.
Butter Boy Keyes 2nd Lass 19686	Holstein	6 years	338	11,314	437	3·86
Canaan Beauty 2nd 21172	"	5 "	327	15,657	499	3·19
Evergreen March 3rd 12659	"	7 "	304	11,508	400	3·47
Lulu Ormsby 27288 (App.)	"	4 "	358	10,937	409	3·73
Ottawa Bessie Anne 27130	"	4 "	365	12,812	480	3·74
Balmangan Queen 2nd 48431	Ayrshire	4 "	285	8,799	352	4·00
Gladys 2548 (App.)	Fr. Canadian	5 "	347	7,999	421	5·26
Zaza Fille 3rd 2537 (App.)	"	2 "	365	5,946	278	4·67
Br. Burma Lady 2537 (App.)	Jersey	7 "	365	8,317	466	5·60
Br. Ruth D 7385	"	4	346	8,115	487	6·00

SHEEP.

Although the lack of pasture is still a great hindrance in the investigational work with sheep, yet the flock continues to improve very rapidly in quality, and is maintained reasonably well as to numbers. At the present time there are 184 head, representing the two breeds, Shropshire and Leicester. Allowing full value for labour, feeds, purchases, etc., the sheep on this Farm have produced a net profit of $962.72 during the year.

SWINE.

A successful year may be reported for this department of animal husbandry work. At the present time the herd consists of 279 head of all ages, being made up of 229 Yorkshires and 50 Berkshires. The comparatively small number of the latter breed is due to the fact that over 80 head of Yorkshire feeders were in the pens, and, further, that the Berkshire litters were purposely delayed for later farrowing. The total figures represent an increase of 63 head over the herd of April 1, 1918. Combining sales with valuation on manure at $2 per ton, a profit of $1,618.82 is shown. It will be remembered that besides the regular debit items of labour, feed and purchase, extra labour for experimental work is also accounted for.

During the past year, as for the previous years of the war, every effort has been directed toward increase of production. All experimental work has been of a nature designed to throw light on the commercial problems of the hog-feeder. At the present time the premises are crowded to capacity. During the year a large number of breeding pigs of all ages were disposed of. Herds were established or increased on several branch Farms from stock bred at Ottawa. Owing to the absolute need of increasing, improving and rebuilding the home herd each year, and of supplying branch Farms with breeding stock, it has been found necessary to curtail the sales of breeding sows to the public. This is to be regretted, and may be corrected only by facilities for increase in breeding operations.

Swine Experimental Work.—The summer experiments of 1918 were as follows:—

1. A study of the self-feeder-pasture method of hog feeding, using various pastures.
2. The value of pastures in the summer feeding of brood sows.

Summer Feeding Experiment No. 1.—Three pasture crops were made use of, rape, barley, and clover. With an acre of the latter crop, 29 hogs were fed for 119 days, consuming 11,145 pounds of grain from a free-choice feeder containing corn, shorts, screenings and tankage. The gains were made at a cost of 8·4 cents per pound, and the percentages of the different grains thus consumed on the "free choice" system are interesting: Corn, 62·2 per cent; shorts, 18·8 per cent; screenings, 11·4 per cent; tankage, 5·6 per cent. The same grain ration, self-fed, to 18 hogs on barley pasture, resulted in slightly decreased cost, ·08 cent per pound. With 18 hogs on rape, gains were made at a cost of 8·7 cents per pound. The surprising feature of this individual test was the fact that six pigs self-fed in an indoor pen on a straight grain ration similar to that fed outdoors, made gains at 5·28 cents per pound, but were unfinished at the completion of the experiment.

Conclusions.

1. That the self feeder makes possible increased production, with a lessened expenditure of labour.
2. That clover pasture in an average season has greater carrying power than either rape or barley.
3. That rape pasture is not an economical or healthful feed for young pigs (the quality and growth of the rape-fed pigs was poor, a fact not indicated by the figures).
4. That no set rule should be followed with regard to the number of pigs to be carried per acre on any crop. During the first weeks of pasturing the growth must be kept down by increased numbers of pigs. These must be removed gradually as they grow. Once the plant attains any considerable advance toward maturity it not only becomes less palatable to the hog, but also ceases to make more growth.
5. That more evidence is necessary with regard to direct comparisons of the cost of limited, versus unlimited feed in pen, paddock and pasture, under the conditions applying at Ottawa.

Summer Feeding Experiment No. 2.—Pasture for brood sows. Nineteen brood sows were pastured on 1 acre of rape for 69 days. Charging $8 per acre for the rape pasture and allowing for a small amount of meal used when the sows were first put on the rape, the cost of maintenance per sow was 69 cents for the period, or 1 cent a day. During this period these sows lost, on the average, 19 pounds per sow.

Ten sows were meal fed on dry lot a mixture of bran and shorts, equal parts, for a period of 99 days, at a cost of $9.97 per sow, or 10 cents per day. These sows gained on the average 57·6 pounds for the period.

From those of the rape-fed sows which farrowed, the following results were obtained: Average number of pigs per litter, 8·9; percentage dead or weak at birth, 13 per cent; percentage raised, 70 per cent.

The litters of the grain-fed sows showed as follows: Average pigs per litter, 12; percentage weak or dead at birth, 41 per cent; percentage raised, 45 per cent.

Conclusions.

1. While the cost to maintain the rape-fed pigs was very small and the numbers and quality of the resultant litters satisfactory, a number of the sows became too thin —one individual having to be removed. A very light grain ration fed once daily to sows on pasture, would but slightly increase the cost of maintenance, and ensure against undue loss of condition.

2. That the maintenance of brood sows by grain only is costly, would be clearly indicated. In this instance poorer quality of litters resulted.

Summer Feeding Experiment No. 2A.—Light meal feeding on pasture for brood sows. Fifteen of the rape-fed sows of the previous experiment were continued for one month on rape, with a light meal ration (2·3 pounds daily). These sows gained an average of 7·3 pounds per individual, and cost to maintain per head was $2.91 for the period, or 9·7 cents per day.

Litters obtained from the foregoing lot would, of course, be largely influenced by the feeding previous to the month of rape-meal feeding. It would appear, however, that the "flushing" as induced by the light meal ration, was beneficial. The average size of the litters was 7, all strong pigs, 100 per cent of which were raised.

Winter Experiments, 1918-19.—Two experiments in winter fattening were conducted with two ages of pigs (*a*) middle and later summer litters (*b*) fall litters. The information sought in both cases mainly had reference to:—

1. Comparison of rations, with particular reference to the comparative utility of standard stock food.

2. Methods of feeding. Unlimited meal (self-fed) versus 3 per cent meal ration (trough fed).

3. Winter housing. Warm quarters, versus closed shed, versus open shed, versus open cabin.

The involved nature of these two winter experiments, and the large number of lots used, make comprehensive, brief recapitulation impossible. Concisely, the important deductions arrived at are as follows:—

1. *Comparison of rations.*—The average cost per pound gain by the following feed under different conditions and fed to different ages of pigs as follows:—

Standard stock food, 6·4 cents (average 5 lots).
Mixtures of standard stock food, corn, shorts, 9·9 cents (average 5 lots).
Schumacher feed, 9·1 cents (average 2 lots).
Ontario standard hog food, 11·1 cents (1 lot).
Monarch hog food, 10·5 cents (1 lot).

Standard stock food was not only able, on the average, to produce the total gain equal to other lots, but, owing to its comparative cheapness on the market, the use of this feed lowered costs correspondingly. Only to illustrate this point are the above averages of value.

2. *Unlimited versus Limited Grain Feeding (Self-feeder vs. Trough).*

a. Fed indoors on the same ration,—
Self-fed hogs made gains at 7·6 cents per pound.
Trough-fed hogs made gains at 4·6 cents per pound.
(Note) *see* Health of Stock.

b. Fed in enclosed shed.
Self-fed hogs made gains at 6·3 cents.
Trough-fed hogs made gains at 11 cents (average).

The average cost to produce gains with the self feeder under all conditions was 9·2 per pound. With trough feeding, a similar average showed 8·8 cents as the cost of one pound of gain. Considering that the latter average was obtained from eleven lots, six of which contained the younger pigs as against four self-fed lots, and further, that the saving of labour was not considered with the latter, the advantage, if anything, rests with the self-feeding method.

3. *Winter Housing.*

a. Hogs from summer litters finished indoors showed an average cost of 11·2 cents per pound gain.
Fed in a closed shed, 11 cents.
Fed in an open shed, 11·1 cents.
Fed in an open cabin, 9·9 cents.

b. Hogs from fall litters fed indoors showed an average cost per pound gain of 6·8 cents. (*See* Health of Stock).
Fed in closed shed, 6·3 cents.
Fed in open shed, 8·2 cents.

c. The Health of Stock. It is frequently impossible to indicate by figures this factor, the most important, probably, of any entering into the feeding of swine. Frequently, low-cost gains do not mean high-quality finish. In the experiments just referred to, crippling, one of the most common ailments with which the swine feeder has to contend, seriously affected the younger hogs fed in the main piggery. Reviewing all lots, fed under all conditions, the following would appear:—
Fed indoors, 20 per cent crippled; 6 per cent total loss.
Closed shed, 6 per cent slightly crippled; 2 per cent total loss.
Open shed, one lot showed no crippling whatever; a second lot of younger pigs showed 20 per cent affected; no total losses.
Outdoor cabin—No crippling whatever, either during experiment or when finished for market.

Previous experiments, pointing to the possibility of economically winter-fattening hogs in cheap shelter, would appear to be amply borne out.

BRANCH FARMS.

The writer, in addition to his duties at the Central Experimental Farm, has officially visited at least once during the year all the Branch Farms and Stations where live-stock work is conducted or expected in the near future. Assistance was given in the establishing of several new herds and flocks, and the organizing and

developing of live-stock work in every possible way. It is notable that in spite of severe handicaps in the shortage of buildings and often shortage of efficient labour, the live-stock work during the past five years has increased on an average nearly 50 per cent per annum on the Dominion Experimental Farm system.

BUILDING PLANS.

The Animal Husbandry Division has again during the fiscal year furnished plans and specifications of proposed new live-stock buildings for branch Farms. Several of these plans, approved by the Director of Experimental Farms, have been used by the Department of Public Works in the construction of these buildings.

A large number, over 500, of plans and specifications of farm buildings have been sent free of charge to farmers throughout Canada, and many excellent barns have been constructed after these plans to the marked satisfaction of their owners.

MISCELLANEOUS.

The correspondence and other office work of this division continue to make rapid growth.

The writer, as well as the staff of assistants, has spent a great deal of time attending a large number of meetings in various parts of Canada and assisting farmers to maintain and, where possible, increase animal production.

The duties of judging at numerous exhibitions, assisting at live-stock short courses, including the Ontario Judges' Course held on this farm, and the studying of live stock conditions and the needs for experimental and demonstrational work have received most careful attention.

DIVISION OF FIELD HUSBANDRY.

REPORT OF THE ASSISTANT DOMINION FIELD HUSBANDMAN, W. L. GRAHAM, B.S.A.

In the Field Husbandry Division the scheme of soil cultural and crop rotation investigation was continued during the year on the branch Experimental Farms and Stations. On the Central Farm no expansion of the work of previous years was possible since all suitable land is now taken up with most important crop rotation work.

As in the past, the cost of production of crops grown under field and rotation conditions is a feature that received considerable attention. The data available are of value in providing farmers and others of the several districts in which the matter is obtained with an outline or basis from which each may proceed to calculate costs according to individual requirements as to labour and other conditions.

WEATHER CONDITIONS AND CROP YIELDS.

Uniformly heavy yields were recorded in the season of 1918. Cool, dry weather in April facilitated seeding operations, all grain being sown by the end of the month. The preparation of land for hoed crops, including potatoes, mangels and Indian corn and the seeding and planting of these were finished by May 24. At this date, grain, meadows and pastures were very promising. June was cooler and wetter than usual and while grain and root crops did well, corn and hay were backward in growth. The first cut of hay was taken early in July averaging 2·25 tons, a second cut brought the average to 3·62 tons per acre for the season. Oats were harvested in August, averaging 77·3 bushels per acre, a somewhat better yield than usual. September was exceptionally wet and cool, making corn harvesting tedious. This crop was excellent,

averaging 18 tons per acre. Potatoes were dug early in October and averaged 275 bushels per acre. The work of after-harvest cultivation and fall ploughing was hampered by continued wet weather in September, October and November, although on the farm all ploughing was practically completed. In the neighbourhood the condition of fall work was deplorable. Late grain was spoiled, the quality of ensilage corn was impaired as the work of harvesting was delayed and very little fall ploughing was done.

YIELD of Field Crops, Central Farm, 1918.

Crop.	Area.	Total Yield.				Average Yield per acre.			
	Acres.	Tons.	Lb.	Bush.	Lb.	Tons.	Lb.	Bush.	Lb.
Corn	34	612	590	. .		18	17	. .	
Oats	40	. .	. .	3,094	14	. .	. .	77	12
Oat straw	40	60	1,525	. .		1	1,038	. .	
Hay	31	112	405	. .		3	1,239	. .	
Mangels	1	29	. .	. .		. .	. .	. .	

COST OF PRODUCTION OF FIELD CROPS, CENTRAL FARM, 1918.

According to requirements, the data obtained on the cost of production of field crops are determined from fixed cost and return values. This is necessary in our work in order that the rotations and individual plot results within a rotation may be compared. This year the cost of production is lower than usual due to the uniformly heavy yields.

Cost of Production of Field Crops, 1918.

Crop.	Area.	Yield per acre.		Cost to produce.		
				per acre.	per ton.	per bush.
	acres.	tons.	bushels.	$ cts.	$ cts.	cents.
Corn	34	18	. .	28 37	1 57	. .
Oats	40	. .	77·3	17 53	. .	18 45
Oat straw	40	1·5	. .	17 53	2 17	. .
Hay	31	3·62	. .	21 40	5 91	. .
Mangels	1	29	. .	42 26	1 49	. .

ROTATION OF CROPS.

To meet the several demands, fifteen rotations are under way at the Central Farm. The observations made, thus far, have led to the conclusion that for average conditions a suitable rotation must include hoed, grain and hay or pasture crops grown in the order named. It has also been found that the principles of crop rotations may be applied under various circumstances. Different combinations may be used, the duration of the rotation may be varied and if necessary two or more rotations may be practiced on the one farm. The main object to keep in mind in all cropping effort, is that the principles of a rotation must be observed if satisfactory crops and suitable soil conditions are to be maintained.

The rotations conducted under regular farm conditions on the Central Farm are herein outlined. The variations among the different rotations are such that one or more of them should be found applicable to average farms requiring varying amounts of different crops.

Rotation "A" (five years' duration).—Hoed crop, manured; grain, seeded down with clovers and grass; clover hay, top-dressed with manure in autumn; timothy hay, field ploughed in August, top-worked and ribbed up in October; grain, seeded down with red clover to be ploughed under the following spring, when the succeeding hoed crop is corn.

Rotation "B" (five years' duration).—Hoed crop, manured; grain, seeded down with clovers and grass, top-dressed with manure in autumn; clover hay, ploughed in autumn; grain, seeded down with clovers and grass; clover hay.

Rotation "C" (four years' duration).—Hoed crop, manured; grain seeded down with clovers and grass; clover hay, timothy hay, field ploughed in August, top-worked and ribbed up in October.

Rotation "D" (three years' duration).—Hoed crop, manured; grain, seeded down with clovers and grass; clover hay.

Soiling Crop Rotation "R" (three years' duration).—Corn for early fall feed, manured; peas and oats to cut green, seeded down with clovers and grass; clover hay to cut green.

The profits per acre for the past year are the second highest in seven years being higher in 1912 the year in which the re-arrangement in crop rotation work was made. The results for the past season were as follows.

Costs, returns and net profits from rotations "A," "B," "C," "D," and "R," 1918.

Rotation.	Cost to operate per acre.	Value of return per acre.	Profit per acre.
	$ cts.	$ cts.	$ cts.
A (five years' duration)	19 77	25 92	6 15
B (five years' duration)	20 20	27 87	7 67
C (four years' duration)	19 55	25 13	5 58
D (three years' duration)	22 60	28 01	5 41
R (three years' duration)	22 93	36 07	13 14

CULTURAL INVESTIGATIONS.

No addition to cultural investigation work has been found possible for several years, due, as has been on several previous occasions stated, to the lack of land. As in former years the following cultural investigations were continued on the Central Farm, Ottawa.

Shallow ploughing and subsoiling versus deep ploughing.—For this experiment two four-year rotations are used, differing only in the preparation of the sod areas for roots or corn as indicated in the foregoing heading. The results for the past season while in favour of deep ploughing are not conclusive and an average of the past several seasons work in this connection fail to show any decided advantage of one method over the other.

SHALLOW PLOUGHING and Subsoiling versus Deep Ploughing.—Average for 7 years, 1912 to 1918, inclusive, of Cost of Operation. Value of crop and Profit per acre.

Year.	Rotation "S." Shallow ploughing and subsoiling.			Rotation "P." Deep Ploughing.		
	Cost of operation per acre.	Value of crop per acre.	Profit per acre.	Cost of operation per acre.	Value of crop per acre.	Profit per acre.
	cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1912	19 47	27 14	7 67	19 02	28 99	9 97
1913	18 13	17 71	0 42	17 52	18 34	0 82
1914	17 96	20 33	2 37	17 36	21 12	3 76
1915	19 02	25 70	6 68	18 84	24 35	5 51
1916	18 83	22 76	3 93	18 86	21 55	2 69
1917	19 38	25 70	6 32	19 36	23 29	3 92
1918	20 10	25 88	5 78	20 14	2 84	7 70
Average of 7 years	18 99	23 60	4 62	18 73	23 64	4 91

Commercial fertilizers as a part substitute for barnyard manure.—In this experiment four four-year rotations are used. All receive similar treatment with the exception of method of application and quantities of manure and fertilizer. The plan of procedure is as follows:—

FERTILIZER Treatment given rotation "N," "X," "Y," and "Z."

Crop.	Rotation "N."	Rotation "X."	Rotation "Y."	Rotation "Z."
Mangels	No fertilizer	Manure, 15 tons	No. manure. Superphosphate 300 lb., muriate of potash 75 lb., nitrate of soda 100 lb.	Manure 7½ tons. Superphosphate 150 lb., muriate of potash 37½ lb., nitrate of soda 50 lb
Oats	No fertilizer	No fertilizer	Nitrate of soda 100 lb.	Nitrate of soda 100 lb.
Clover hay	No fertilizer	No fertilizer	Nitrate of soda 100 lb.	Nitrate of soda 100 lb.
Timothy hay	Pastured.	No fertilizer	Nitrate of soda 100 lb.	Nitrate of soda 100 lb.

The results show the distinct advantage of barnyard manure alone over commercial fertilizer alone for this soil but point to the possibility of combining the two to good advantage when barnyard manure is scarce or high in price.

Rotation and cultural experiments on the branch Experimental Farms and Stations.—On the branch Farms and Stations crop rotation and soil cultural investigations have been under way for several years. On the eastern Farms, mixed farming rotations similar to those on the Central Farm, Ottawa, are in operation. In the prairie provinces both mixed farming and grain growing rotations are under way.

With a view to giving information as to methods of cultivation likely to prove satisfactory, a system of soil cultural experiments including methods of prairie breaking, preparing land for crops, moisture conservation, forage crop production, weed eradication and conservation and increase of soil fertility, is being followed in the different prairie provinces. In eastern Canada work of a similar nature has been started at Charlottetown, P.E.I., and will likely be extended to several of the other eastern Farms and Stations as soon as circumstances permit.

From the work to date, no definite conclusions can be drawn and it is probable that several years' data will be required before decisions can be made. The summary reports from the branch Farms contain more detailed observations on this work.

DIVISION OF HORTICULTURE.

REPORT OF THE DOMINION HORTICULTURIST, W. T. MACOUN.

The year 1918 will long be remembered by horticulturists in the provinces of Ontario and Quebec as one of the most disastrous to orchards that have ever been recorded in the history of Canada. The winter of 1917-18, while a very severe one, was but little, if any, severer than that of 1903-4, when much injury was done also, but the trees were late in starting into growth in 1917 and ripening of the wood was, on this account doubtless, not so thorough as in most seasons and there were very low temperatures in the early part of the winter. Many apple, plum and pear trees were killed and many more so weakened or badly injured that they will not recover. During the past sixty years there have been seven winters which have caused heavy losses among fruit trees in the provinces of Ontario and Quebec. These were the winters 1858-9, 1876-7, 1884-5, 1895-6, 1898-9, 1903-4, and 1917-18. Of these the winters of 1884-5, 1895-6 and 1898-9 were winters with little or no snow on the ground in the middle of winter, and root killing was the principal form of injury. During the past twenty years the two winters which have proved most destructive were those of 1903-4 and 1917-18, and in neither of these winters did trees suffer from root-killing in Eastern Ontario and the province of Quebec as there was a heavy covering of snow. There were 306 apple trees, including 164 varieties, killed in the orchards of the Experimental Farm, Ottawa, by the winter of 1903-4, and by the winter of 1917-18 there were 360 trees killed, including 200 varieties, and it is expected that still more will die which were badly injured. The temperature was below zero on 55 days in the winter of 1917-18 and for three months there was no real thaw. It was -25° F. as early as December 12, 1917, and the lowest temperature was -30.8° F. on December 30, 1917.

It is interesting to record that bearing trees suffered more than young trees not yet in bearing, and among the bearing trees those that had borne a good crop in 1917 were, as a rule, killed, when those which had borne little or no fruit in 1917 were practically uninjured. A row of trees in a Wealthy orchard at the Experimental Farm, planted in 1896, may be taken as an example. This was an outside row on the north side of the orchard. Tree 1 had died some years before, and tree 2 was in bad condition before winter, so they are not included.

Variety.	Row and Tree.	How affected by the winter of 1917-18.	Yield, 1917.
Wealthy	Row 8 trees 1 and 2		
"	" 8 tree 3	No killing back	No crop.
"	" 8 " 4	Killed	12 gallons.
"	" 8 " 5	No killing back	3 "
"	" 8 " 6	Killed	33 "
"	" 8 " 7	No killing back.	3 "
"	" 8 " 8	Badly injured	15 "
"	" 8 " 9	Died in a previous year	
"	" 8 " 10	Badly injured	35 "
"	" 8 " 11	Badly injured	16 "
"	" 8 " 12	Killed	30 "
"	" 8 " 13	No killing back	10 "
"	" 8 " 14	Killed	19 "
"	" 8 " 15	No killing back	No crop.
"	" 8 " 16	Killed	27 "
"	" 8 " 17	No killing back	No crop.

Thus, of 14 trees, the eight which bore a medium to good crop in 1917 were either killed or badly injured, while the six which had either a light crop or no crop at all came through in good condition.

In addition to the apple trees, practically all trees of European plums were killed, and even Russian varieties of pears which had withstood many winters were either killed or badly injured. Some trees of sour cherries were also killed.

FRUIT CROP.

In the autumn of 1917 there was promise of a very good crop of apples at Ottawa in 1918, as the foliage had been good during the growing season and the fruit buds were well developed but, owing to the very severe winter, the crop was a light one, as many trees which were not killed had their buds killed. Other trees also were weakened and the growth was poor, resulting in small, poorly-coloured fruit on the whole. Notwithstanding the very severe winter, the American plums or improved native varieties bore a good crop of fruit of excellent quality and offered another demonstration of the reliability of these plums in parts of Canada where the European or domestic plums are so uncertain. The crops of small fruits were medium to good, currants, gooseberries and raspberries not having suffered to any extent from the severe winter. During most of the cold weather they were well protected by snow. The crop of grapes was medium to good but, owing to the very cool autumn, few varieties ripened.

VEGETABLES.

During the war the interest in vegetable growing increased very much and reached its maximum in 1918. Every effort was made by the Horticultural Division to meet the demand for information by experimental work in the growing of vegetables and vegetable seed, by experiments and demonstrations in methods of canning, by the preparation and distribution of literature on vegetable growing and vegetable seed production, and by addresses and demonstrations.

Experiments with Vegetables.—While experiments were conducted with other vegetables, special attention was paid to the potato in 1918.

Potatoes—Importance of Source of Seed.—Since 1907 experiments have been conducted to compare the results obtained from seed of the same varieties of potato from different sources, and the results have been very marked. These results have been published from time to time in the annual reports and in bulletins, and it is known that many potato growers have obtained much larger yields than they otherwise would have done by following the recommendations to use seed from the best sources. Briefly stated, it has been found that potatoes grown in a relatively cool climate are much better for seed, as a rule, than those in a relatively warm climate. Hence, potatoes from the Maritime Provinces, from the cooler parts of Ontario and Quebec, from the Prairie Provinces, and from the cooler parts of British Columbia, are better, as a rule, for planting in parts of the province of Ontario where the summers are warm than those grown locally. There are not yet sufficient data to decide how much of this superiority is due to the greater freedom from certain diseases where the climate is cool and how much is due to the effect of the climate on the vitality or vigour of the seed. At Ottawa, as at many other places in Canada, certain physiological diseases are quite prevalent.

In 1918 the results at Ottawa were as marked as in other years, and show the importance of using good seed. Green Mountain potato from the Experimental Station, Fredericton, N.B., that had been grown there in 1917, yielded at the rate of 387 bushels 12 pounds per acre at Ottawa in 1918; grown at Fredericton in 1916 and at Ottawa in 1917, the yield in 1918 was only 193 bushels 36 pounds per acre; and grown two years at Ottawa only 96 bushels 48 pounds per acre; and from one lot only

57 bushels 12 pounds per acre. Irish Cobbler potato from Fredericton grown there in 1917 yielded at Ottawa at the rate of 525 bushels 48 pounds per acre, while different lots from seed which had been grown in Fredericton in 1916 and at Ottawa in 1917 yielded in 1918, 129 bushels 48 pounds per acre in one case and 41 bushels 48 pounds per acre in another, and in one case where the potatoes had been grown on muck land at Ottawa in 1917 and dug on September 7, or about a month before the usual digging time, the yield was 250 bushels 48 pounds per acre. One lot which had been grown at Fredericton in 1915 and at Ottawa in 1916 and 1917 yielded only 26 bushels 24 pounds to the acre in 1918. The best yield of Irish Cobbler at Ottawa in 1918 was obtained from seed grown at Peterboro, Ont., in muck land, in 1917. This yielded at the rate of 616 bushels per acre.

Potatoes—Time to Plant.—As potatoes yield fairly well, even when planted rather late, if given good attention, it is the practice with many farmers in the province of Ontario to delay potato planting until the latter part of May when most of their other crops are in, but experiments at Ottawa for several years have shown that, if the largest yields are desired, it is well to plant early in May. The results obtained in 1918 are much like those obtained in other years, and are as follows:—

Planted.	Irish Cobbler, yield per acre.		Green Mountain, yield per acre.	
	bush.	lb.	bush.	lb.
May 14	421	12	470	48
" 27	363		402	36
June 10	330		321	12
" 24	94	36	70	24

From the results obtained at Ottawa and the branch Farms and Stations, the following general recommendations for planting potatoes throughout Canada may be made. Where the spring is early and autumn frosts early, plant early. Where the spring is early and summers are dry, plant early. Where the spring is late and autumn frosts do not come until late, early planting is not so important. Where the spring is late and autumn frosts are early, plant as soon as the soil is dry enough.

Vegetable Seed Production.—Experiments in the production of vegetable seeds were continued on a larger scale in 1918 at Ottawa and at the branch Farms and Stations than in previous years. It was not known how long the war would continue and whether the shortage in vegetable seeds would become more acute, hence it was desired to show what vegetables could be grown successfully for seed purposes in Canada and how they should be grown so that those who desired to grow seeds for their own use would have information that would enable them to do so.

At Ottawa good seed was grown of beans, beats, cauliflower, cabbage, carrots, celery, corn, cucumber, lettuce, melons, onions, parsley, parsnip, peas, peppers, pumpkins, radish, salsify, spinach, squash tomato and turnip or nearly all the principal vegetables. The plot on which these were grown varied in size from about one-fifth acre down. The results obtained in former years from home-grown seed showed that, on the whole, it was as good, or better than, imported seed. More information was obtained in 1918 on methods of wintering the more difficult kinds of vegetables intended for seed production.

Experiments for the Control of Cabbage Root Maggot.—The results of experiments in the control of the cabbage root maggot at the Central Experimental Farm in 1918 indicate that corrosive sublimate and oakum are two very promising remedies

for the maggot. The corrosive sublimate was used at the rate of 1 ounce to 10 gallons of water and applied four times at intervals of a week beginning immediately after the plants were set out, about a teacupful of the poisonous preparation being poured around each plant. The method of using oakum was to press a small amount of the material around the base of the plant. The tar felt disc has in the past been found the best preventative, and gave a slightly larger number of heads in 1918, but the other methods are easier to follow. The results were as follows from sixty plants set out on May 25 for each method: Oakum, 52 marketable heads, weight 94 pounds 8 ounces; tar-felt paper discs, 54 marketable heads, weight 105 pounds 4 ounces; corrosive sublimate, 47 marketable heads, weight 96 pounds 12 ounces; unprotected, 21 marketable heads, weight 29 pounds 2 ounces.

Vegetable Breeding.—There is such a vast area in Canada where the season of warm weather is relatively short that much attention has been paid in the Horticultural Division for some time to the breeding of varieties which will be ready for use early and will mature early. The breeding and selection of new sorts was continued in 1918, and some of the most promising are being multiplied. Special attention is being paid to corn, beans, tomatoes, melons, onions and peas, but other kinds of vegetables are being selected to, improve if possible, the variety.

CANNING FRUITS AND VEGETABLES.

Experiments and demonstrations in the canning of fruits and vegetables were continued in 1918. Great interest was shown in the work by the public, and many persons availed themselves of the privilege of coming to the Experimental Farm to learn the best methods. Demonstrations and exhibits of canned vegetables were again made at the Central Canada Fair, and numerous questions were asked by many persons among the thousands who visited the Experimental Farm exhibit. Experiments with different recipes made in 1917 were checked in 1918, and new ones tried. Experiments to determine the relative merits of different varieties of apples, plums, raspberries and strawberries when canned or preserved and, in the case of apples, when made into apple sauce, were continued and useful results obtained.

GREENHOUSES.

The greenhouses were kept fully occupied in 1918, crops of cucumbers, tomatoes, lettuce and melons being grown, while an experiment was tried in producing cauliflower seed under glass and, while the time required to mature the crop made it somewhat expensive to grow, a fair crop of seed was obtained.

Cucumbers were tested at different distances apart and a number of varieties compared. Davis Perfect, Rennie's XXX and Giant Pera were three of the most productive sorts.

As a result of the experiment with different varieties of head lettuce in 1917-18, it was decided again to test the four varieties which had succeeded best, these being the Sutton Golden Ball, Veitch Golden Queen, Early Paris and Earliest of All. The experiment was again very successful, there being an almost perfect stand of well-headed plants, and there seems no good reason why Canadian growers of lettuce should not grow these varieties where better prices can be obtained for head lettuce than for Grand Rapids. The Earliest of All showed some scalding on the leaves, but the other three were practically free, and from two years' test can be recommended with confidence if grown with care. The two first varieties cannot be distinguished from each other. The Early Paris is the most compact and is larger but not quite so attractive in appearance as the Golden Ball and Golden Queen. The Boston Market

lettuce was later in heading than the others and scalded considerably. Different distances apart were tried and from the results obtained six inches apart is quite sufficient for Golden Ball and Early Paris.

Bonny Best has proved the most satisfactory tomato in the greenhouse so far.

Chrysanthemums, Cyclamens, Schizanthus and Geraniums were the principal flowers grown, the beds on the grounds being supplied with geraniums from the houses. Many fine new varieties have been originated at the Experimental Farm, Ottawa.

ORNAMENTAL GROUNDS.

The ornamental grounds were again much admired by visitors in 1918, and must be an inspiration to many Canadians to beautify their homes. Experiments were continued with many kinds and varieties of annuals, special attention having been paid to asters and sweet peas. The collections of pæonies, iris, phlox, roses and lilacs have now included in them a large number of the best sorts.

PUBLICATIONS.

Because of the great demand for information in regard to vegetables during the war and the importance of having information available for returned soldiers who might desire to go into horticulture a special effort was made to meet this demand by the publication of pamphlets and circulars, and the following were prepared by the Dominion Horticulturist and published during the year:—Vegetable Gardening at Home and on Vacant Lots (Circular 14); When Should Potatoes be Planted to Obtain Maximum Crops? (Special Circular No. 18); Importance of Planting Good Seed Potatoes for High Yields (Special Circular No. 19); Every Gardener His Own Seed Grower, Part 1 (Special Circular No. 12); Part 2 (Circular No. 17); Selection and Wintering of Biennial Vegetables for Seed (Circular No. 15); Digging and Storing of Potatoes (Pamphlet No. 15); How to Make and Use Hotbeds and Cold Frames (Pamphlet No. 19); Tomato Culture, Mushroom Culture, Forcing Rhubarb in Winter (Pamphlet No. 22); Cabbage Culture, Cauliflower Culture (Pamphlet No. 23); Asparagus Culture, Celery Culture, Onion Culture (Pamphlet No. 24); Melon Culture (Pamphlet No. 26). A bulletin on The Strawberry and Its Cultivation in Canada was also prepared and sent to press before the close of the year.

VISITS TO BRANCH FARMS AND STATIONS AND CORRESPONDENCE.

By his annual visits to the branch Farms and Stations, the Dominion Horticulturist is able to keep in touch with the work which is going on there by coming in personal contact with it and studying the local conditions of soil and climate and is thus more competent to assist the superintendents than if such visits were not made. Twenty of the principal Farms and Stations were visited in 1918. Weekly reports are received from the superintendents throughout the year, which keeps the Dominion Horticulturist in very close relations with the superintendents and their work and, in addition, there is much correspondence with them in regard to supplies and other matters of interest in horticulture.

The general correspondence of the Horticultural Division has been very heavy during the war as thousands of persons became interested in horticulture, particularly in vegetable culture, who had never done so before, and this correspondence reached its maximum in 1918, but was attended to promptly.

POULTRY DIVISION.

REPORT OF THE DOMINION POULTRY HUSBANDMAN, F. C. ELFORD.

THE WORK OF THE DIVISION.

The work of the division this year has progressed more satisfactorily than it has for the past few years, in that for most of the year better help was procurable. During the first of the year there was some changing of men but towards the close, and especially since the end of the year, men for the branch Farms have been more available and at the present time there is a better class of men in charge of the work than ever has been.

The young stock, though late last spring, matured fairly well, with the result that those entering the laying pens in the fall were well developed. The weather being mild, the yield during the winter was above the average and the prospects are for a good hatching season this spring.

NEW STATIONS.

A start was made at two new Stations this year, Lennoxville, Que., and Summerland, B.C.

The poultry buildings at Lennoxville were not completed and it was found impossible to put in the stock in the fall. A start with chicks will be made in the spring. A number of chicks were hatched at Summerland and one house of laying hens kept over the winter. Preparation is being made to make a start also at Rosthern during the coming spring.

EXPERIMENTAL WORK.

A very brief summary follows of experimental work conducted by the Division at the Central Farm and the branch Farms.

BREEDING WORK.

While a certain amount of attention is being paid to cross breeding, the main work is in the endeavour to produce heavy laying strains of the most suitable varieties.

After some years' work, it was found advisable on account of limited accommodation and other circumstances, to confine the work to fewer varieties than had been used in the past, so it was decided that Barred Plymouth Rocks, White Wyandottes and White Leghorns should be the breeds to be used.

Even with the reduction in the number of varieties, progress is not rapid as, in the three varieties, only as many pullets can be kept as should be kept for each one. However, according as the branch Farms become developed, they are taking up this work, so that more progress will be possible.

For the recording of the work, a number of forms are used, the most important of which is the "Egg and Breeding Records" on the reverse side of which are the "Pedigree and Photographic Records." This form contains a general summary of the information gathered from the sheets devoted to "Chick Records" "Male Mating Records" "Mating" "Hatching Records" and the "Monthly Egg Records."

To keep track of the chicks from the various matings the following methods are used: When the eggs are collected (trap-nests being used) the number of the pen and the number of the hen that laid the egg are marked on the end of each egg. When the eggs are set, a record of the number set from each hen is kept. On the eighteenth day the eggs are placed in pedigree baskets. These baskets are made in two sizes, one to

hold three or four eggs and the other to hold eight or nine. Only the eggs of one hen of a breed are placed in a given basket so that when the chicks hatch, each individual hen's chicks are known.

When a chick is taken from a basket a band is wrapped loosely around its leg. At three weeks of age the band is removed from the leg—a slit is cut in the web of the wing back of the ligament—avoiding the veins—and the band is inserted and sealed. This band remains on the bird throughout life. When the pullets are put into winter quarters the "Mature band" is put on the leg. The number on the leg band is the number under which the bird goes through life, the wing band being the connecting link between the chick records and the "Egg records" so that in case the leg band is lost, the bird may still be identified by the wing band.

On the "Mature" bands year letters are used—this avoids the use of large numbers and indicates the age of the individual. Thus, if the records were started in 1917, the numbers for that year would be preceeded by A, in 1918, the numbers would be preceeded by B and so on. If a hen bears the band "A" it indicates that the hen was hatched in 1917, and is therefore, in 1919, in her third year. If "B" she was hatched in 1918, and is therefore in her second year, and so on.

Space will not permit of full details of the system of records, but those who are interested can obtain full information by writing this division.

THE BEST TIME TO HATCH.

The best time to hatch chicks for winter eggs has always been debatable, and in order to obtain data on this records were kept for the hatches for five spring months, February to June.

According to the percentages of fertility, the months are rated in order of high fertility as follows: February, May, March, June and April. In the percentages of total eggs hatched the order was May, June, February, April and March. The percentage of fertile eggs hatched placed the months in the following order: April, May, June, February and March. The total number of eggs required for one live vigorous chick on July first gave the following order: April, May, February and March. The June hatches were omitted from this.

These results indicate that the best month to hatch in order to get the greatest number of live healthy chicks was the month of April.

WINTER EGGS.

This experiment was carried on through the winter in order to see which chicks would give the best return in eggs during the winter months, and the results go to show that, for early winter eggs, the April hatched birds are also best.

It was not possible to have this part of the experiment carried out fully at all the plant, but the figures at those Stations where these figures could be collected show about the same variation that does the plant at Lethbridge, Alberta, from which branch farm the figures were most complete. These figures also show what 160 well-matured Barred Rock pullets can do if they are well looked after.

This lot of pullets was divided into three pens:—

No. 1 pen	55	Barred Rock	pullets,	hatched	March 29.
No. 2 "	55	"	"	"	April 21.
No. 3 "	50	"	"	"	May 18.

Egg yield for three Barred Rock Pens of Pullets for five winter Months—Winter 1918-19 at Experimental Station, Lethbridge, Alta.

Month.	Pen No. 1 hatched March 29.	Pen No. 2 hatched April 21.	Pen No. 3 hatched May 18.	Total per month.	Average per month per bird.
November.....	873	782	231	1,886	11·7
December..	1,046	1,183	883	3,112	19·4
January.....	1,044	1,185	1,015	3,244	20·2
February...	841	957	693	2,491	15·5
March	931	884	888	2,703	16·8
Totals ..	4,735	4,991	3,710	13,436	
Average per bird	86	90·7	74	84	16·

FINANCIAL RETURNS.

Pen	No. eggs.	Value.	Cost of feed.	Balance.	Balance per bird.
		$ cts.	$ cts.	$ cts.	$ cts.
No. 1	4,735	257.57	79.45	178 06	3.23
No. 2	4,991	274.04	70.70	193 34	3.51
No. 3	3,710	206.46	58.19	148 27	2.96

Though all birds made a good profit, much better than the average pullet hatched throughout Canada, there was considerable difference between the April and the May hatches, a difference of $55 on the 100 birds.

HATCHING RESULTS OF BREEDS.

The four most popular breeds kept at the Experimental Farms, and which may be considered the popular breeds of Canada, Barred Rocks, White Wyandottes, White Leghorns and Rhode Island Reds showed the following average fertility and total eggs required for one chick hatched:—

Variety.	Per cent Fertility.	Total eggs required for 1 chick.
Barred Rocks	77·9	2·8
White Wyandottes..	57·5	3·1
White Leghorns.....	88·0	2·1
Rhode Island Reds..	80·8	3·0
Average....	74·6	2·9

Hens vs. Pullets for Fertility and Total number of Eggs required for 1 Chick Hatched.

Age.	Fertility.	Total Eggs Required for One Chick.
Hens..	73·7	2·4
Pullets..	79·8	2·9

The pullets when compared with the hens did much better than is generally supposed. These pullets, however, were strong vigorous birds and well matured. Late-hatched or poorly-developed pullets should not be considered as fit for breeding at any time.

EGG LAYING CONTEST.

An egg laying contest was started in Prince Edward Island November first last on the Experimental Farm poultry plant at Charlottetown. This was staged because of the keen interest the farmers of the island are taking in commercial poultry and in compliance with a repeated request for a contest.

The added interest which the contest has occasioned is considerable and there is no doubt that it has demonstrated the practical value of laying contests as a means of placing emphasis on production.

Since this contest is the first that the Federal Department of Agriculture has conducted, the Rules and Regulations are given.

PRINCE EDWARD ISLAND FIRST ANNUAL EGG LAYING CONTEST.

To be held at the Experimental Farm, Charlottetown, commencing November first, nineteen eighteen, and continuing for eleven months until September 30, 1919.

Rules and Regulations.

This competition will be known as "The First Prince Edward Island Annual Egg Laying Contest." It will be conducted on the Experimental Farm at Charlottetown, and under the direction of the Poultry Division of the Experimental Farm.

Board of Management.—The board of management will be, The Dominion Poultry Husbandman; Superintendent Experimental Station; J. G. Morgan, Superintendent of Contest; and W. Ker of the Poultry Division, Live Stock Branch.

Scope and Number of Entries.—The contest will be open to all. It will consist of 20 pens of 8 females—hens or pullets. The first twenty bona fide applications received will be the twenty accepted. Contestants will be privileged to maintain throughout the year a full complement of eight birds. No males will be included.

Fees.—The entry fee for each pen will be One Dollar ($1) which must accompany the application.

Prizes.—Suitable prizes will be awarded the winning pens.

Classes.—There will be two classes: Class 1, consisting of the Light Breeds; Class 2, consisting of the Heavy Breeds.

Delivering the Birds.—The birds must be delivered at Charlottetown, express prepaid, between the fifteenth and twentieth of October, nineteen eighteen. The shipment should be addressed "Laying Contest, Experimental Farm, Charlottetown," and must also have the name and address of the shipper plainly marked on the shipping crate.

Rejection of Birds.—Any birds arriving in a sick condition may, at the discretion of the Contest Superintendent, be rejected and either destroyed or shipped back to the owner. None but pure-bred birds will be accepted, and only those birds that lay a marketable sized egg. The Superintendent will have the right to clip the wings of any birds that may prove troublesome.

The Standard for Judging.—The rating of the birds or pens will be determined by the number, together with the size, the uniformity and marketing value of the eggs. The Canadian standards for eggs will be adhered to.

Feed and Care.—The birds while in the contest will receive the best of feed and care, but this will be subject to the judgment of the Board of Control. The eggs

from all will be the property of the Government and will go towards the cost of feed, but each contestant will be entitled to the record of each bird he has in the contest and to a statement showing the receipts and expenditure of his pen for the eleven months.

Housing. The contest will be housed in double colony houses 10 x 12 feet divided into two pens having glass and cotton fronts. The houses will be placed on the poultry plant of the Experimental Farm facing the railway as it runs through the farm.

Reports. A summary of the standing of each pen in the contest will be compiled at the close of each month, a copy of which will be supplied the owner of each pen. The summary will also be provided the press of Canada and will thereby help to keep before the public Prince Edward Island as an egg producing centre.

Return of the Birds. If no notification as to the disposal of the birds has been received by September 1, 1919, the birds on the completion of the contest will be sent by express, collect, to owner's address from which the shipment was made.

Entry forms, will be supplied on application by addressing Superintendent, Experimental Station, Charlottetown, P.E.I.

NOTE.—No person except the officials of the contest will be allowed into the pens or yards after the birds have been housed. Every effort will be made to keep the birds quiet and no interference with them or their feed will be permitted.

FARM EGG AND POULTRY ACCOUNT.

The Division has continued to send out blanks of this form. A circular will be issued later giving data as to methods and results in more detail than is possible here.

TOBACCO DIVISION.

REPORT OF THE CHIEF OFFICER, F. CHARLAN.

From the point of view of tobacco growing, the season of 1918 was chiefly remarkable on account of the difference between the climatic conditions that affected the yield and quality of the crop in the province of Quebec and that in Southern Ontario.

Speaking generally, the early spring was very favourable to the plants in the seed beds and the transplanting into the fields both in Ontario and Quebec took place earlier than usual.

In Quebec, however, the summer was remarkably rainy and somewhat cool so that on a great number of plantations the tobacco crop could not reach a normal development, both on account of the flooding of the land and the coolness of the weather. In Ontario the temperature was higher but vegetation was greatly damaged by long periods of drought which were only broken by very light showers. The situation improved about the middle of September which permitted late plantations to give a crop almost normal in weight.

It might reasonably have been expected after the active demand for tobacco in 1917 that there would be a considerable increase in acreage devoted to this crop in 1918. This hope, however, was not completely realized for, in spite of the favourable spring, the production of plants in the seed beds was not sufficient. However, the 1918 harvest was a larger one than that of the preceding year. For Ontario it was estimated at about six million pounds of White Burley and about one million pounds of bright flue cured tobacco of the Virginia type. Exact figures for the Province of Quebec are not available. The area planted was at least 25 per cent greater than

that in 1917. Unfortunately, in Quebec, in some cases, the crop was touched by the frosts of September. Probably the total production in the Province of Quebec was about five million pounds. The bright flue cured tobaccos of Ontario furnished, speaking generally, a product not so well developed as usual but of a good colour.

The development of the White Burleys depended to a great extent on the time at which they were harvested. The curing of the Ontario Burleys was effected under favourable conditions and the colour of these tobaccos was clearer than that obtained during the preceding year. The curing of the Quebec tobaccos was difficult on account of the excessive humidity of the autumn. The prices received for the Ontario tobacco in the year of 1918 were the highest ever known. The greater part of the White Burley was sold at prices varying from 30 to 35 cents per pound, while the flue-cured tobaccos of Virginia type were disposed of at from 40 to 60 cents per pound. The tobaccos of Quebec were sought for at the beginning of the season at a price reaching and sometimes exceeding 40 cents a pound. Only a small amount, however, was sold at this price before the period of stripping. The demand was less at the beginning of the winter but became greater again in January, when certain crops of tobacco suitable for binders were then sold at very high prices, exceeding fifty cents a pound.

EXPERIMENTAL STATION, HARROW, ONT.

The experimental work undertaken at the Harrow Station in 1918 tends to confirm, in a general way, the results obtained the previous year. In the disinfection of the seed beds good results may be obtained by sterilizing them with steam at 100 pounds pressure for thirty minutes. The seed beds covered with glass and the semi-hot beds proved themselves distinctly superior to all other types, even in the relatively mild climate of Southern Ontario.

Fall ploughing proved distinctly better than spring ploughing and it is also more economical, permitting of a better utilization of the animal and manual labour of the farm. It is also one of the best means of defence against insect pests.

As early transplanting as possible is to be recommended. This allows of harvesting the tobacco a little earlier in the autumn and thus assures a better curing. Moreover, the early planted fields seem to suffer much less from drought.

The use of arsenate of lead against the cut-worm proved very efficacious as it was also against the tobacco horn worm.

The mosaic disease did less damage than in preceding years. It was even noticed that a plot of the Warne tobacco, slightly attacked by mosaic at the beginning of the season, seemed to recover entirely before harvest. The best means of combatting mosaic would seem to be the prompt pulling up of the plants affected. Tobacco root rot (Thielavia Basicola) was frequently noted on the tobacco plants at the station and some plots were seriously affected. The greatest damage was noted to occur on clay soil. A close examination revealed the fact that those plants, on the roots of which a quantity of soil from the seed beds still adhered, were particularly subjected to attack. It seemed that in these conditions the putting forth of new roots in the soil of the plantation was considerably kept back.

The practice of splitting the tobacco stems at harvest time cannot be too strongly recommended in Canada. Some fifteen days are gained thereby in the curing period and a brighter coloured product is obtained. The test of varieties of flue cured tobacco showed that on rather strong land the Hickory Pryor furnished a tobacco of a brighter colour and more brilliant than did the Warne. Among the narrow leaved varieties the Flanagan furnished an excellent product of a good clear colour and firm texture and making an excellent type of pipe tobacco. A selection of Burley Resistant gave a higher yield in weight than that of Burley broad leaf. The latter had been planted a little late and consequently suffered more from the drought so that it is hardly fair to draw a conclusion as to its relative merits from this one test. As to colour, the Burley Resistant and the Burley Stand-Up gave a brighter product than

did the Broad Leaf. The Burley Resistant should be cultivated exclusively on land affected by tobacco root rot but on clean land the Burley broad leaf and Burley Stand-Up should be preferred as usually these give a higher return.

The crop of tobacco seed produced at Harrow in 1918 was less than that of the preceding year in spite of the fact that a larger number of seed plants had been preserved. Pollination of these took place under unfavourable weather conditions so that the yield was considerably reduced.

EXPERIMENTAL STATION, FARNHAM, QUE.

In 1918 this station was devoted to the culture of Big Ohio x Sumatra, of Yamaska, of Brazil and of Mexican tobaccos. The two latter varieties are suitable for cigar wrappers and were studied from the point of view of acclimatizing them in Canada and at the same time so preserving the aroma so as to meet the needs of our cigar manufacturers. The Yamaska may be employed either as a cigar wrapper or a binder with an appreciable aroma. The Big Ohio x Sumatra was studied with a view to the production of a binder of fine texture and of a milder flavour than the Comstock Spanish and seems destined, in Canada, to take the place of the Connecticut Broad Leaf. The work in this connection would appear to have almost reached success.

The seed beds were very successful and showed no signs of disease. We were able to furnish plants to neighbouring planters as well as to make numerous replacements in our own planations.

Transplanting took place earlier than usual, commencing May 27. The first area was planted under very favourable conditions but the weather changed suddenly, turning cold with strong winds which dried the plants out and covered the young plants up before they could establish themselves firmly. This made necessary a great deal of replanting under difficult conditions. The work was finished on June 17, although under normal conditions it should have been finished in the first five days of that month.

Growth at first was very slow. The temperature remained low during the whole season. The rains were very frequent and often very heavy. From May 27 to September 15 a rainfall of 27½ inches was registered. Under such conditions all that could be done was to save part of the crop. The heavy frost of the night of September 9 almost completely destroyed the plants of Big Ohio x Sumatra. What remained of the crop, instead of furnishing tobacco suitable for cigar wrappers, only gave a little tobacco for pipe use. Curing took place readily enough for the tobacco harvested from August 27 to September 3 but was difficult for the crop brought in the last days of September, during the wet weather.

Insect damage was relatively small.

The untimely frost of the night of June 19 only caused small damage. It indicates, however, how the 1918 tobacco crop was subjected to adverse weather conditions.

Until August, the possibility of a crop seemed doubtful. However, from August 10 the tobacco plants developed rapidly. Unfortunately, however, the plants had been topped before that date, leaving only a limited number of leaves on each plant. However, under the influence of the constant rains, the tobacco plants developed without thickening of the leaves but they budded very vigorously which gave great difficulty and extra work in going through the plantations and removing the buds systematically.

The texture of the Farnham tobacco was, as was feared, deficient in quality both for use as wrappers and as binders.

Two selections of Big Ohio x Sumatra tested in 1918 are at present almost fixed from the point of view of shape and elasticity of leaf. The tip of the leaf is supple, a result which has never before been obtained to such a marked degree. A selection of

Brazil St. Felix, in spite of the rigour of the season, did very well on the plantation and it is hoped that it may be possible to acclimatize it. It gave vigorous plants with leaves of an average size, sufficiently large for fillers and of suitable form.

EXPERIMENTAL STATION, ST. JACQUES L'ACHIGAN.

In 1918 this Station was devoted exclusively to the growing of filler tobaccos such as Cuban and Brazil.

For the first time since the station was established, the raising of seedlings was not a success and it was necessary to bring some seedlings from the Farnham Station. The tobacco plantation suffered from the same extreme temperatures as did that at Farnham. Ripening took place sufficiently early but the leaf had not reached its usual size. However, a fairly large percentage of fillers was secured of a type interesting enough from the point of view of aroma and which it is hoped to bring to the attention of manufacturers. The striking feature of the harvest at St. Jacques in 1918 was the considerable proportion of yellow and apparently withered leaves. When handling the crop in the warehouse, a large number of very thin leaves, on which the veins seemed to have almost disappeared, were noticed. Had the crop been larger these might have been experimented with as to their suitability for cigar wrappers.

Tobacco Diseases.

In a general way, in Ontario tobacco diseases were less common than in 1917 or 1916. However, in the seed beds a larger proportion than usual of plants were noticed attacked by "damping off." The cause seemed to be insufficient ventilation during the warm weather of spring and over wetting.

Selections.

Among the hybrids tried in Ottawa (first generation) a crop of Maryland gave very encouraging results. In spite of the damp season a fair proportion of lemon yellow leaves, slightly streaked with green, was secured, one of the types of Maryland most sought after on the European market.

The Espada x Cuban and the Espada x Vera Cruz promised to be suitable for the production of fillers, at least from the point of view of yield and probably from that of aroma, if it is possible to combine the characters of the Espada and Mexican or those of the Espada and the Cuban. The production in Canada of a filler of good aroma and giving a good yield is one of our most pressing problems.

Production of Tobacco Seed.

Results of a systematic trial of tobacco seed growing undertaken in 1918 at Harrow and at Ottawa seem to indicate that seed of the first quality may be obtained without allowing the capsules to mature entirely in the field. They may be gathered as soon as the upper half of the capsule is brown. They are then hung up in a place, clean and well aired, until they finish drying. The seed is threshed out in December. The harvesting of the seed capsules before they are entirely ripe permits one to avoid the sometimes serious losses when the capsules open either on the plant or when they are being collected.

Study of Tobacco Soils.

The work in this line made marked progress in certain districts of Ontario. The results obtained were used in the preparation of Experimental Farms Bulletin No. 38 on "The Growing of Flue-Cured Tobacco in Canada."

Inspection Work.

This is more and more appreciated by the tobacco growers. The work has been still further developed in Ontario and the growers with whom our inspectors have come into touch seem more and more disposed to take advantage of the information furnished them and also to keep the inspector in touch with their needs and plans. In a general way, the majority of the growers seem to give their tobacco crop all the necessary attention both on the plantation and in the curing barn but, in topping, the work is often done much too late.

Co-operative experiments with fertilizers.

The inspectors of the Tobacco Division have secured the co-operation of a certain number of tobacco growers willing to make, under our direction, a thorough test of chemical fertilizers on their tobacco crop.

These planters realize the advantage resulting from the rational use of chemical fertilizers which, even with the high prices obtaining for fertilizers during the war, still showed a marked profit. The importance of the use of chemical fertilizers in tobacco growing is more and more recognized and those growers who have experimented with the fertilizers supplied them by the Department have decided to employ them on a still larger scale at their own expense.

Statistics.

In the course of his journeys through Ontario, the inspector has been able to collect the necessary data for the preparation of exact statistics as to the quality of tobaccos produced in 1918 in that province. Thanks to ever-closer co-operation with his correspondents, it is hoped soon to be able to give an estimate of the tobacco crop each year which will be almost exact, at least in so far as the plantations in Ontario are concerned. The growers are kept in touch with the condition of the crop by monthly bulletins sent out from the first of June.

CENTRAL EXPERIMENTAL FARM, OTTAWA.

As usual, the experimental field at the Central Farm was devoted to the production of tobacco seed and to the study of new varieties. The temperature kept so low during almost all the season that the seed harvest was considerably reduced and from a number of varieties no seed whatever could be obtained.

Transplanting took place in good time but growth remained very slow until the first of July. The crop was damaged by the hailstorm of June 30 which left very few leaves untouched. The Cuban and Mexican varieties succeeded very well but the Brazils had some difficulty in maintaining themselves owing to the unfavourable weather. The plantation made rapid progress from the beginning of August and developed to a marked extent during the latter half of that month. From that time, growth was extremely fast and had it not been for the hailstorm of June 20 one of the best tobacco crops ever gathered at Ottawa would have resulted, although probably the ripening would have been a little later. The selections already made preserve their characteristics and are even improving somewhat. A greater uniformity was noted in the selection of Comstock Spanish, of Yamaska and of Big Ohio x Sumatra.

Warehouse work.

Samples of filler tobacco cured in the course of the winter 1917-18 were sent to some Canadian manufacturers. It seems to be well established that the Canadian Zimmer Spanish has an assured future in this country. Among the tobaccos of the

1918 crop, the best results as to aroma were obtained with the Cuban and the Brazils of St. Jacques. The aroma of the Mexican of Farnham is perhaps a little finer than that of the Brazils but it is difficult to express a decided opinion on tobaccos produced under such unfavourable conditions. The comparison between the filler tobacco fermented in bulk and fermented in the case by the method of forced fermentation, showed that fermentation in bulk is the better for the development of aroma.

Seed Distribution.

In the course of the winter, the Tobacco Division distributed a little more than 5,000 samples of tobacco seed. The requests from Quebec growers were mostly for Comstock Spanish. The number of requests for White Burley received from Ontario were much above those received in preceding years and all requests could not be filled. It seems that the demand for large Seed Leaf of Connecticut type has considerably fallen off in the province of Quebec as has also that for General Grant. This is explained by the high prices offered for Comstock Spanish of the 1918 harvest in which the ordinary pipe tobaccos have not participated.

DIVISION OF BEES.

REPORT OF THE APIARIST, F. W. L. SLADEN.

The rapid rise in the price of honey, begun in 1917, was continued in 1918, when a wholesale price of 22 cents to 25 cents per pound was reached and received for much of the white honey crop in Ontario and Quebec. In some parts of Ontario the production of honey per colony was above the average, but for Canada as a whole, the season was only fair. The long and severe winter of 1917-18 caused heavy winter losses where bees were not prepared for winter with the best of care. The winter losses were particularly heavy in the Annapolis Valley, N.S.

Bees were kept at sixteen of the Experimental Farms during the year. The following table gives the yield per colony of each apiary in 1918 with the annual average production since the year 1913.

Production from Bees at Experimental Farms.

	Average weight of honey produced per colony, spring count, in 1918.	Average Annual Production in past Six Years.		
		Period.	Weight of honey produced per colony, spring count.	Value of net production per colony, honey and bees.
	Lb.		Lb.	$ cts.
Charlottetown, P.E.I.	0·0	6 years	1913-18	19·3	0 87
Nappan, N.S.	63·8	6 "	1913-18	95·8	12 88
Kentville, N.S.	40·7	5 "	1914-18	47·4	8 11
Fredericton, N.B.	72·5	5 "	1914-18	50·9	9 91
Ste. Anne, Que.	..	5 "	1913-17	60·0	10·39
Cap Rouge, Que.	68·0	6 "	1913-18	58·7	8 79
Lennoxville, Que.	..	1 year	1918	..	6 00
Ottawa, Ont.	196·5	6 years	1913-18	121·6	17 27
Brandon, Man.	51·6	6 "	1913-18	30·0	3·27
Morden, Man.	0·0	2 "	1917-18	14·0	(loss) 0 05
Indian Head, Sask.	..	3 "	1915-17	29·8	11 83
Lethbridge, Alta.	86·5	5 "	1914-18	76·2	16 49
Lacombe, Alta.	84·9	4 "	1915-18	52·6	12 79
Invermere, B.C.	118·9	5 "	1914-18	70·5	13 26
Summerland, B.C.	96·4	3 "	1916-18	61·8	11 81
Agassiz, B.C.	38·2	5 "	1914-18	34·5	4 48
Sidney, B.C.	62·4	5 "	1914-18	29·9	5 68

In beekeeping, the climate of Canada presents, more definitely than that of the region to the south, two principal problems and an opportunity. The problems are the control of swarming and the reduction of loss of bees in winter, and the opportunity, hitherto scarcely recognized, is the very favourable conditions for raising bees in spring before the honey flow begins. At Ottawa the swarming instinct is so intense, and the time it dominates so long, that the most convenient way to prevent swarming has been found to be the radical one of removing the queen at the beginning of the honey flow from clover, followed, eight days later, by the removal of all queen cells except one from which a young queen is raised. The wintering problem has been found to be mainly a matter of raising plenty of young bees and providing them with wholesome stores, although, among careless beekeepers, the greatest losses in winter are due to insufficient protection or protection started too late, and insufficient stores. To better meet the two problems, and utilize the opportunity, a system involving the raising of two queens in each hive during the honey flow in July and keeping them there until the following May when one of them with her bees and brood is transferred to a separate hive, was planned and tried on a small scale at the Central Experimental Farm during the year. This system gives promise of an increased yield of honey with less labour.

Progress was made in our attempt to breed a non-swarming variety of bee. A number of queens were bred at the Central Experimental Farm from the only colony out of thirty-one in the apiary that made no preparations for swarming. Some of these queens were taken by the Apiarist in nuclei with drones of selected parentage to Kapuskasing, Ont., and Lake Edward, Que., to be mated, there being no probability that other drones were present in the neighbourhood of these places. Several matings were obtained, and much information which it is expected will facilitate such breeding work in the future was secured.

Beekeeping conditions in the northern part of Canada were studied concurrently with the mating experiments. This study has shown the advantages that would be obtained by protecting the hives better throughout the active season, and by having the bee-cellar for wintering better insulated and better drained, and has indicated certain advantages possessed by black or hybrid bees in parts of the north over Italians which have been found superior in the more southern parts of Canada.

At the Central Farm 6,485 pounds of honey were taken from thirty-three colonies, spring count.

Two colonies were placed near a recently burned-over area of bush containing raspberry and fireweed at Chelsea, Que., on May 22, and left there for the summer. 250 pounds of surplus honey were taken from one of these colonies and 228 pounds from the other.

Different kinds of winter stores for bees were tested at Ottawa in 1918-19, and special attention was paid to substitutes for syrup made from refined sugar on account of the serious shortage of this due to the war. Syrup made from raw sugar was found inferior to that from refined sugar, and a brand of cane syrup (golden syrup) killed in three months the only colony to which this was supplied. Dandelion honey was found to be unwholesome, but the white honey gathered in July, 1918, was found wholesome. The best results however, were, as usual, obtained from the regular stores supplemented with a liberal amount of syrup made from refined sugar.

Eight colonies on the latter stores that were wintered outside, packed in planer shavings in two cases taking four colonies each standing in our sheltered apiary, wintered somewhat better than four colonies on similar stores in the cellar. In one of the cases which had from five to six inches of side packing, the bees wintered no better than in the other which had only two and a half to three inches and the loss of weight of the outside wintered bees between October 11, 1918, and April 23, 1919, was slightly less (average loss 24 pounds) than that of the colonies wintered in the cellar (average loss 27½ pounds).

DIVISION OF ECONOMIC FIBRE PRODUCTION.

REPORT OF THE FIBRE SPECIALIST, R. J. HUTCHINSON.

At the Central Experimental Farm, Ottawa, the work has progressed very satisfactorily during the past year. A number of varieties of flax-seed were tested as usual for the purpose of ascertaining their comparative value in the different flax areas in the Dominion.

Variety Tests.—During the year a total of 12 acres, including six varieties of seed, were tested at the Central Experimental Farm. The yields of the varieties were, on the whole, good, as is evidenced by their average yield per acre.

	Long Stem.	Ontario Dutch Child.	Imported Child.	Indian Head Long Stem.	Japanese Siberian.
Retted straw per acre	2,960 lb.	2,990 lb.	2,954 lb.	2,502 lb.	2,894 lb.
Average yield flax fibre per acre	499 "	455 "	489 "	326 "	334 "
Scutched fibre per acre	1,685 "	1,521 "	1,655 "	1,300 "	1,170 "
Average value of scutched fibre per lb	72c.	72c.	75c.	50c.	50c.

The flax grown in each plot was valued separately. The above figures represent the average of the valuations.

Small plots of Irish Riga Child, Canadian Common and Argentine seed were also grown. The two former produced fibre suitable for low grade fibre purposes, but comparative scutching tests were impracticable because of the small quantity of straw available. The crop produced from Canadian Common, a variety usually grown for seed, was similar in character to that from Minnesota 25, though coarse and not so uniform in length. The Argentine seed produced, as was expected, short-branched plants quite unsuitable for fibre purposes.

Flax Tests.—Over thirty-two acres of flax in plots were grown in different districts throughout Canada, the bulk of the crop being grown on the Experimental Farms system. Flax grown in the province of Quebec gave satisfactory results, although the fibre was rather short but the quality and spinning nature were excellent. Owing to the late arrival of the flax from the several other provinces, it was impossible to carry out retting operations during the present year.

Prairie Flax Straw Experiments.—Further experiments were made with prairie flax straw. About 1,000 pounds of fibre produced from the straw was shipped to Kitchener, Ontario, where commercial spinning experiments were made. Binder twine with soft, even surface, three-ply-spun, gave 750 feet to the pound with a breaking strain of 60 pounds and 50 pounds respectively. The breaking strain did not vary more than 1½ to 2 pounds either way. The experiments were so successful that the Saskatchewan Department of Agriculture urged further experiments on a factory basis. The Dominion Department accordingly provided the necessary financial assistance. A factory at Regina, Saskatchewan, was equipped with the necessary machinery to produce in commercial quantities a raw flax fibre. The fibre will be shipped east and further experiments will be made in the manufacture of coarse towelling, commercial twines and sackings. If the fibre proves as successful as we hope, this utilization of the western fibre will help to meet the fibre shortage.

Retting Operations.—A considerable quantity of flax was again retted in concrete tanks. The operations were in progress from April till October, for commercial purposes. Experimental work was resumed later. Little alteration was made in the general lines of investigation, the experiments of 1917 being in many cases repeated. By the kindness of the Guelph Spinning Company, Ltd., and the Linen Thread Company, Ltd., the fibre from the retted experiments was tested in the hackling process and gave excellent results both for yield and high spinning qualities.

Commandeered Seed.—In view of war conditions the British authorities made a special request that all available Canadian seed (fibre variety) be commandeered for the purpose of securing an adequate supply of sowing seed for Ireland. By Order in Council dated October 23, 1918, all surplus flax-seed in Canada was commandeered, over and above such quantities as were needed to seed an area for each mill in 1919 equal to the area seeded in 1918. One hundred and ten thousand bushels were purchased, inspected, graded, sealed and stamped under the supervision of this division. The shipments were made direct to Ireland in lots of 400 sacks of 182 pounds each. The price realized was $27.50 per sack f.o.b. cars.

Government Flax.—One hundred and seven acres of flax grown by the Ontario Department of Agriculture on the Willowdale farm, Toronto, was shipped to this division for threshing, retting and scutching. The crop had been damaged to a considerable extent by moulding. A great deal of work was required in grading the seed and straw. The crop has been threshed, the seed cleaned, graded and shipped to Ireland. That portion of the seed unsuitable for sowing will be returned to the Ontario Department of Agriculture.

Grading.—The system of fibre grading was started in several of the mills in southwestern Ontario. The grades are as follows:—

Dew Retted Qualities.—

D. P. A. Superior Dew Retted Warp.
D. P. B. Medium Dew Retted Warp.
D. P. C. Medium Dew Retted Weft.

This system in so far as it was possible to operate it, worked very satisfactorily. The difficulties to contend with are many; the greatest obstacle being the so called scutchers who are not conversant with the desirable fibre qualities of flax. Hence it will require two or more seasons in which to school these men in making uniform and consistent grades.

Pulling Machines.—In view of the existence in Canada of a number of flax-pulling machines of different designs, and in various stages of development, it was desirable to make a thorough investigation into the suitability of these machines for Canadian conditions. In addition, other flax machinery and several processes merited careful inquiry.

With the approval of the Director of the Experimental Farms, two months were spent in various parts of the flax districts in Ireland. As a result of the investigation it is hoped to obtain a flax-pulling machine, a de-seeding machine and a scutching machine, all of which offer to give satisfaction.

DIVISION OF CHEMISTRY.

REPORT OF THE DOMINION CHEMIST, FRANK T. SHUTT, M.A., D.Sc. F.I.C.

Since the outbreak of the Great World War our energies have been more immediately and particularly directed towards assisting the man on the land with a view to a greater production of foodstuffs on the farm. This work has been carried on by correspondence, analysis, special circulars, press articles, etc., and there is satisfactory evidence that this educational and advisory campaign has been fruitful in its results.

This phase of our activities is by no means a new one. The "getting in touch" with the individual farmer and helping him with his daily problems has been an important feature in the work of the division since the establishment of the Experimental Farm system, for from the first we have held the view that, taking the country as a whole, there has been and will be for many years as great a need for the dissemination of the basic principles of agriculture as known to-day as there is for the advancement of our knowledge, thorough investigation and research. Agricultural chemistry furnishes not only the explanation of, but directs to a right and economic course in, a large number of farm operations—with soils, manures, fertilizers, crop growth, feeding of live stock, etc., etc.—and it would seem imperative for the best possible and most profitable results that the farmer should be furnished with that knowledge and assistance which this science alone can offer. And in this propaganda work we may feel certain that every farmer, every agricultural society so educated and enlightened, becomes a centre, consciously and unconsciously, for the spread of the knowledge and introduction of good practice. In peace days as well as in times of war, this "extension" work must be considered as well worth while, since we believe it serves not only immediately to increase production but also permanently to improve and render more profitable the occupation of farming.

The prosecution of investigatory and research work in connection with problems related to Canadian agriculture—a work which would naturally occupy a first place in the division's activities—has not been neglected. However, owing to the large amount of special work arising out of war conditions that has fallen to our share, it has not been possible to make the progress with the purely investigational work that marked pre-war times. As opportunity offers, and the work and the staff, with the establishment of peace, assume their normal condition, the investigations and experiments temporarily suspended, will again receive our attention.

SAMPLES RECEIVED FOR ANALYSIS.

In the subjoined table a classification is given of the samples received for analysis during the past fiscal year. The total, 9,568, exceeds that of the previous year by 5,729 and indicates the very large increase in the laboratory work that has been undertaken by the division. A very large proportion of this increase consists in the samples of flour, condensed milk and other articles submitted in connection with what may be regarded as special war work.

SAMPLES received for Examination and Report during the twelve months ending March 31st, 1919.

Samples.	British Columbia.	Alberta.	Saskatchewan.	Manitoba.	Ontario.	Quebec.	New Brunswick.	Nova Scotia.	Prince Edward Island.	Total.
Soils	14	200	6		29	50	16	1	3	319
Muds, mucks and marls	10		2		4	13	3	2	7	41
Manures and fertilizers	9	1	1		29	51	33	12	1	137
Forage plants, seeds and fodders	4	8	4	8	551	33	5	1	3	617
Waters, including rain and snow	3	16	29	4	78	13	5	4		152
Samples from Meat and Canned Goods Division										2,691
Miscellaneous, including dairy products, fungicides, insecticides, etc.	36	41	20	4	569	48	10	18	13	759
War Office samples (flour)										4,852
										9,568

EXAMINATION OF SOILS FOR FARMERS.

This phase of our work continues to grow in popularity. It consists rather in examination and diagnosis than in analysis, with the view of furnishing information of a suggestive and helpful character as to treatment with manures and fertilizers, the necessity or otherwise of drainage and liming, the presence of alkali, suitable crops, etc. Farmers desiring assistance of this character are supplied on application with a special "form" on which to enter particulars as to past cropping and manuring, etc., etc., information necessary to the satisfactory interpretation of the results of our examination.

INVESTIGATIONAL WORK WITH FERTILIZERS.

Experiment, Plan E.—This new scheme, embracing 60 variously treated plots, was introduced (in 1918) on the farms and stations of the Experimental Farm system, at Charlottetown, P.E.I., Kentville, N.S., Fredericton, N.B., Cap Rouge, Que., and Agassiz, B.C. Its primary object is to determine the most profitable combination and quantity of a fertilizer mixture, as measured by its influence, in relation to cost, throughout a three-year crop rotation consisting of, 1st year: hoed crop, 2nd year: grain, 3rd year: hay.

Complete Fertilizer Series.—While intimately correlated as a whole, the various sections of the scheme may be studied individually. In plot series 1 to 8 (24 plots) two quantities each of nitrate of soda, superphosphate and muriate of potash are applied in every possible combination, plot 1A receiving the three basic maximum and plot 8A the three basic minimum quantities. This method permits a comparative study of proportions, while the inclusion in each series of B and C plots—to which three-fourths and one-half, respectively, of the quantity of the corresponding A mixture are applied—permits a comparison of quantities.

In plot 1A the maximum quantities of nitrate of soda, superphosphate and muriate of potash combine to form a mixture equivalent to one ton per acre of either a 4:8:8 or a 3:10:5 fertilizer, the first formula being used for potatoes and the second for turnips as the first crop of the rotation.

While in each instance the fertilizers are expected to extend their influence throughout a three-year crop rotation, the fact is recognized that, as compared with

turnips, potatoes are likely to draw more heavily upon the available supplies of nitrogen and potash and less heavily on that of the phosphoric acid; hence the reason for varying the initial formulæ.

The No Potash Series.—The inclusion of a complete series (11 to 15) without potash was considered desirable in view of the fact that potash is at present practically unprocurable and will not be plentiful for some time—perhaps years—to come.

Series 16 and 17.—At Kentville and Fredericton, in series 16 one-half, and, in series 17, the whole of the nitrogen is furnished in the form of sulphate of ammonia, while at Charlottetown, Cap Rouge, and Agassiz, series 16 and 17 are devoted to a similar test with basic slag as the partial or exclusive source of phosphoric acid.

Series 18 and 20.—In series 18 to 20 organic sources (abattoir by-products) of nitrogen and phosphoric acid are tested. In series 18 one-half, and, in series 19, the whole of the phosphoric acid—besides a proportion of the nitrogen—is furnished by tankage. In series 20 abattoir by-products—dried blood, tankage and bone meal—are employed exclusively to furnish both the nitrogen and phosphoric acid.

Manure and Fertilizers.—Since none of the areas involved had been manured for several years, all were treated, in the fall of 1917, to a uniformly light dressing of barnyard manure, at the rate of 10 tons per acre, fertilizer series 8, 9, 14, 15 received 15 tons and plots 21A and 21B (manure alone) 20 and 15 tons, respectively, per acre.

Check Plots.—These are situated at fairly regular intervals throughout the area, and among the number is a permanent check plot which will receive no fertilizer or manurial treatment whatsoever.

Results from the First Crop of the Rotation.—While any attempt to draw definite deductions from the results at this stage would be premature, certain inferences therefrom are warrantable.

The salient features revealed in a general study of the returns from comparable plots are: (1) the very striking lack of productiveness shown on the permanent check plot, which for more than five years has received neither manure nor fertilizers. (2) the uniformly low standing of the checks which received only the initial light dressing of manure and no fertilizer; (3) the beneficial influence of additional manure when used in conjunction with the fertilizers; (4) the distinctly lower yields produced from heavy applications of manure alone as compared with those from the practice of supplementing smaller quantities of manure with fertilizers; (5) the probability that, on certain soils treated to liberal amounts of nitrate of soda and superphosphate, potash in the fertilizer is less essential than where nitrate and phosphate are sparingly applied; (6) the superiority, in the first season, of nitrate of soda as the sole source of nitrogen as compared with sulphate of ammonia and certain organic sources of nitrogen constituting the whole or part of the nitrogenous component of the fertilizer, and (7) the evident greater influence, at this stage, of the more readily available forms of nitrogen and phosphate acid in comparison with those contained in organic substances.

Sources of Nitrogen.—In an experiment, conducted at the Central Experimental Farm, Ottawa, the relative values of nitrogen, furnished in nitrate of soda, nitrate of lime, sulphate of ammonia and dried blood, were studied in the potato crop. Dried blood failed to give any increase in yield over that of the plot which received no nitrogen in the fertilizer, whereas the other more soluble nitrogenous fertilizers produced from 30 to 50 bushels in excess of the yield from the no-nitrogen plot. At Agassiz, B.C., whale guano, as a source of nitrogen, was compared with nitrate of soda in fertilizer mixtures for mangels and corn. In neither instance did the whale guano increase the yield appreciably, whereas nitrate of soda brought increases of 12 to 20 per cent.

These results must not be too strictly interpreted or deemed of general application; under different seasonal conditions the organic sources of nitrogen might have appeared to greater advantage. Of course, the nature of these organic fertilizers would lead one to expect their maximum influence to be deferred until the latter part of the season of growth, and, indeed, sometimes until the following year.

Sources of Phosphoric Acid.—In the greenhouse a pot experiment, now in progress, has for its object the determination of the relative values of phosphoric acid furnished in ground raw rock phosphate, superphosphate, three grades of basic slag, and "Tetraphosphate," the latter being the product of a newly patented Italian process. The pot test is intended as a preliminary check trial to precede experiments in the field at the Experimental Station, Cap Rouge, Que., and the Central Experimental Farm, Ottawa.

Sources of Potash.—Following an experiment, conducted last year, the results of which indicated that ground nepheline syenite may possess a distinct value as a potash fertilizer, another pot test with various new or unusual sources of potash is now under way, and is also intended as the forerunner of more extensive field experiments.

Experiment in Mangel-seed Production.—In co-operation with the Division of Forage Crops an experiment was conducted on areas devoted to the growth of "stecklings" and full-grown roots for seed production. The greatest yields of seed were obtained from plots which had received 200 pounds of nitrate of soda and 500 pounds of superphosphate per acre. A decrease of 19 per cent in yield followed the reduction of the nitrate of soda to 100 pounds per acre, nitrogen having proved to be the limiting fertilizer factor in the experiment. The omission of potash failed to depress the yield. Where no manure was applied, the yields from the check plots were only 40 per cent of those from the nitrate and superphosphate plots, while with manure the yields from the checks were 78 per cent of those from the fertilizer plots.

Influence of Manure on Irrigated Areas.—At Summerland, B.C., the results from two years' experiment agree in showing that applications of barnyard manure depressed the yields of both potatoes and oats. Mr. Helmer, the superintendent, suggests as a possible explanation of the phenomenon that the area was, perforce, inadequately irrigated and that, under these circumstances, the manure rapidly absorbed the water and withheld it from the crop. Plans have been made to test this theory thoroughly in an experiment where both the quantities of manure and of irrigation water will be varied.

Liming Experiments.—At Kentville, N.S. the application of ground limestone, alone and in conjunction with fertilizers and manure, continues to indicate very substantial profits from the practice, while, at Fredericton, N.B., neither burnt lime nor ground limestone has exerted any appreciably favourable influence, despite the fact that the soils on which they were used gave evidence of being deficient in lime.

At Cap Rouge, Que., three years' results from an experiment in which burnt lime and ground limestone are used in varying quantities with and without manure, indicate that, on the average, burnt lime has been about 12 per cent more effective than the ground limestone equivalent.

FERTILIZER MATERIALS.

These have included samples of limestone, marl, wood ashes, tobacco ashes, boiler and flue ashes, saline deposits and waters alleged to be rich in potash, muds and mucks, and a number of newly introduced fertilizers, e.g. "tetrafosfate," "slag and potash," etc.

The limestones were submitted chiefly by provincial agricultural authorities, with the view of determining the value of the several deposits for the manufacture of ground limestone. This work has shown the necessity of analysis previous to working the deposit, if the loss involved by grinding low grade rock would be avoided.

LIMESTONES, 1918-1919.

Lab'y. No.	Locality.	Mineral Matter insoluble in acid.	Carbonate of lime.	Carbonate of magnesia.	Oxide of iron and alumina.
33826	Amqui, Que	6·32	87·75	4·57	1·36
33827	"	24·90	58·50	12·80	3·92
33828	"	21·94	59·50	14·46	3·84
37036	Dorchester, N.B....	10·22	84·80	3·37	1·61
37037	"	32·00	57·19	10·37	0·44
37038	"	43·24	53·98	2·22	0·56
37555	Moncton, N.B	20·32	3·43	5·75	4·80
37556	"	26·70	63·60	3·80	5·90
37557	"	48·00	38·45	4·85	8·70
38725	Lower Millstream, N.B.	0·70	1·64	...	0·22
38726	" "	10·86	83·81	3·05	2·28
38727	" "	5·32	81·34	0·94	2·40
39449	Chandler, Que..	1·84	96·14	0·86	1·16
40113	Florenceville, N.B	15·80	77·89	2·61	3·70
40114	Keswick, N.B ..	32·74	60·15	5·41	1·70
40115	Hartland, N.B....	9·80	87·87	0·53	1·80
41763	Joggins Mines, N.S.	41·20	43·14	2·50	5·52
41764	" "	36·16	47·57	2·12	6·04
41765	" "	40·30	44·72	2·42	5·62
41766	" "	43·28	41·91	2·50	5·90
41767	" "	34·12	52·51	2·28	5·58
41373	Montreal, Que...	11·46	86·40	..	1·32

The value of ground limestone as an amendment for soils in need of lime—and of these there are many in Ontario and Eastern Canada—is becoming year by year more widely recognized.

Marl is found in many parts of Canada and analysis has shown that many of the deposits are of high quality. It is a form of lime eminently adapted to agricultural use, being soft and friable when air-dried and in this condition readily prepared for application to the land. Of the eight samples submitted to analysis, seven contained over 85 per cent carbonate of lime, as calculated on the air-dried material.

The potash content in the several samples of wood ashes examined varied from ·76 to 8·25 per cent. These results clearly show the importance of purchasing this potash fertilizer on guaranteed analysis; no physical examination could satisfactorily determine the value of a sample.

Two samples of tobacco ash yielded 16·22 and 24·78 per cent of potash, respectively. This product, when free from extraneous and foreign material, is an extremely valuable fertilizer, though owing to variation in potash content it should always be purchased on guaranteed analysis.

Tannery ashes, chiefly from spent tan bark (hemlock), have given from ·5 to 1·00 per cent potash and a sample of ashes from a sawmill using largely spruce refuse contained 5·02 per cent potash.

The boiler and flue ashes have shown from ·5 per cent to ·75 per cent potash.

A sample of "Fosforite" a native calcium phosphate, from Italy, and used in the manufacture of "Tetrafosfate," was found to contain 26·18 per cent total phosphoric acid, 17·94 per cent phosphoric acid soluble in 1 per cent citric acid solution and 2·43 per cent soluble in neutral ammonium citrate solution.

"Tetrafosfate," invented by Professor Stoppani of Bologna, Italy, is prepared or manufactured by heating together a mixture of the ground phosphate rock,

magnesian-limestone, and soda ash and hydrating the mass. Our analysis of this product gave: total phosphoric acid 25·66 per cent, phosphoric acid soluble in 1 per cent citric acid 13·22 per cent and 2·07 per cent soluble in neutral ammonium citrate solution.

A fertilizer prepared by fusion of feldspar with basic slag was submitted to us for trial and analysis by Mr. H. S. Hammond, Macdonald College, Quebec. The laboratory results are as follows:—

	Phosphoric Acid. p.c	Potash. p.c.
Total	10·97	0·88
Water soluble	Nil.	0·26
Citrate soluble	7·62	—
One per cent citric acid	10·68	0·84

In our report for 1915 the results are given of our analysis of a potash fertilizer from feldspar; prepared by Professor C. W. Drury of Queen's University. Improvements in the method of manufacture, it is alleged, have been made since that date and the analysis of a sample received in February, 1919, afforded the following data:—

	Per cent.
Total potash	5·98
Potash soluble in 1% citric acid	5·75
Potash soluble in water	·26

THE FERTILIZING VALUE OF RAIN AND SNOW.

Following our practice since 1907, analysis has been made of every fall of rain and snow throughout the year, the object of the investigation being to determine the value of the precipitation as a source of available nitrogenous crop food.

The several determinations consisted of free ammonia, albuminoid ammonia and nitrogen as nitrates and nitrites. During the year 81 samples of rain and 29 of snow were analysed.

The total precipitation for the year ending February 28, 1919, was 35·59 inches (rain 27·77 inches, snow 77·97 inches) and the total nitrogen supplied thereby amounted to 5·845 pounds per acre.

Reserving the somewhat voluminous details for future publications the more important data may be summarized as follows, the results for the preceding year and the averages for the decade 1907-1917 being added for the purposes of comparison.

PRECIPITATION AND AMOUNTS OF NITROGEN FURNISHED BY RAIN AND SNOW.

	Total precipitation in inches.	Nitrogen.		
		by rain.	by snow.	Total.
		Lbs. per acre.	Lbs. per acre.	Lbs. per acre
Year ending February 28, 1919	35·59	4·929	·916	5·845
Year ending February 28, 1918	32·86	4·719	1·540	6·259
Average for 10 years ending February 28, 1917	33·173	5·482	1·101	6·583

The results from the past 12 years' work in this investigation, taken generally, indicate that the precipitation at Ottawa contributes from 6 to 6·5 pounds of available nitrogen annually per acre, of which 80 to 85 per cent is furnished by the rain. We may safely assume that this nitrogen is fully as valuable agriculturally as that in our more soluble nitrogenous fertilizers and would be worth at present prices 30 cents per pound. On this assumption the nitrogen supplied per acre by the rain and snow would be worth roughly $1.80.

This investigation has brought out other features of scientific and hygienic interest in connection with the precipitation. The discussion of these may be deferred.

SOILS FROM IRRIGATION TRACTS IN ALBERTA.

The chemical and physical examination of soils from areas about to be placed under irrigation in Southern Alberta has been proceeded with and considerable progress made. This work has been undertaken at the request of the Reclamation Service, Department of Interior, to assist in the classification of certain areas into irrigable and non-irrigable lands. In addition to the determination of the "alkali" content of the soils and subsoils in question, a study is being made of the relation of alkali to crop growth and the influence of irrigation on the vertical distribution of alkali.

AGRICULTURAL METEOROLOGICAL RESEARCH.

This research, undertaken in co-operation with the Meteorological Service, has for its object the study of the influence of climatic and seasonal conditions on the yield and composition of crops.

Pressure of work requiring immediate attention has seriously interfered with the progress of this investigation, but the accumulating material is being so preserved that its study may readily be proceeded with when opportunity permits. Information of a valuable character to Canadian agriculture may undoubtedly be looked for as this work progresses.

SUGAR BEETS FOR FACTORY PURPOSES.

The numerous inquiries received during the past year from widely distant points in the Dominion, as to the possibility of the successful culture of the sugar beet crop and the establishment of beet sugar factories, may be taken as evidence that there is a keen interest at the present time in the development of this important industry in Canada. At the present time the only factories operating in Canada are those of the Dominion Sugar Company, located at Wallaceburg, Kitchener and Chatham, in south-western Ontario. From reports and statistics it would appear that the industry as carried on in these factories has been satisfactory and successful to both grower and manufacturer.

There are many factors to be considered before a decision can be arrived at as to the prospect for the successful operation of a beet sugar factory in any particular locality, and of these the suitability of soil and climatic conditions for the production of a root rich in sugar would appear to be of fundamental importance. Realizing the desirability of obtaining reliable data on this particular phase of the subject we commenced a number of years ago the systematic testing out of certain approved varieties of sugar beets on the several farms, stations and substations of the Experimental Farm system. This investigation ought to be of considerable value since it indicates year by year, the quality of the raw material of the industry—the sugar beet—produced in a number of localities in the several provinces of the Dominion, information of basic significance to those engaged in the serious study of the question as it may arise in various parts of Canada.

The principal varieties used last season (1918) in this investigation were Klein Wanzleben and Vilmorin's Improved, the seed being obtained from Messrs. Vilmorin, Andrieux et Cie., Paris, France, and "Russian" and "Canadian" from seed grown in Russia and Canada respectively and kindly supplied by the Dominion Sugar Co., Wallaceburg, Ont. The varietal averages, as obtained from the results of the analyses of the beets grown at the eighteen points throughout the Dominion, in respect to sugar content, are as follows:—

VARIETIES OF SUGAR BEETS, 1918.

	Sugar in Juice. (average).	Co-efficient of Purity. (average).
Klein Wanzleben	16·59	84·19
Vilmorin's Improved	16·62	82·74
Russian grown (variety unknown)	15·99	82·03
Canadian grown (variety unknown)	17·02	80·45

These results furnish confirmatory evidence respecting the high quality of the beets from Canadian grown seed. As in 1917 the home-grown seed produced beets fully equal, if not superior, to those from imported seed.

In addition to the above, "Italian Grown" seed was sown at Ottawa, Ontario and Sidney, B.C., "Wohanka" (from seed imported from Russia) at Charlottetown, P.E.I., Ottawa, Ont., Lethbridge, Alta., and Agassiz, B.C., and "Raymond" (Alberta seed), at Lethbridge, Alta. The averages of these are as follows:—

	Sugar in Juice. (average).	Co-efficient of Purity. (average).
Italian, source of seed, Italy	17·58	88·50
Wohanka, " " Russia	16·94	87·13
Raymond, " " Alberta	15·67	82·58

Averaging the results from the several varieties and arranging them according to locality of growth, we obtain the following interesting data:—

SUGAR IN JUICE IN SUGAR BEETS, 1918.

	Sugar in Juice. (average).
Charlottetown, P.E.I.	16·74
Kentville, N.S.	19·83
Nappan, N.S.	20·10
Fredericton, N.B.	17·99
Lennoxville, Que.	15·98
Cap Rouge, Que.	18·47
Ste. Anne de la Pocatière, Que.	10·93
Brandon, Man.	15·91
Rosthern, Sask.	15·25
Scott, Sask.	15·26
Indian Head, Sask.	14·11
Lethbridge, Alta.	15·94
Fort Vermillion, Alta.	19·96
Agassiz, B.C.	17·28
Summerland, B.C.	18·07
Invermere, B.C.	15·14
Sidney, B.C.	18·70
Ottawa, Ont.	16·86

Since, for the most part the same varieties were grown at each of the above Farms and Stations, the differences in sugar content to be noted in the foregoing are largely, but by no means entirely, due to seasonal characteristics. Though the results, taken as a whole, are not quite equal to those of 1917, they indicate that beets eminently satisfactory for factory purposes have been grown at a number of points throughout the Dominion. With a few exceptions these results give evidence of excellent quality and support the general deduction previously made in connection with this investigation (now in its eighteenth year) that in so far as the factor of quality is concerned very satisfactory beets could be grown in the larger number of our provinces.

FIELD ROOTS.

On an increasing number of farms, field roots, and more especially mangels and turnips, constitute an important factor in the ration of many classes of the live stock. And rightly so, for not only are they nutritious, palatable and readily digested, but they perform a useful function, by reason of their so-called medicinal qualities, in keeping the animals in a healthy, thrifty condition. But little attention however has hitherto been paid by the farmer to their specific value from the feeding or nutritive standpoint and since varieties may vary widely in this respect we have been obtaining data for a number of years past as to composition of the several varieties generally found upon the markets. Later, and more particularly during the past two or three seasons the quality of field roots as produced from Canadian or home-grown seed, has also been ascertained.

The data of this investigation, now in its fourteenth year, are necessarily voluminous and it will therefore only be possible in this summarized report to give a few of the more important results.

All the roots analysed were grown on the Experimental Farm, Ottawa, and consequently the results may be considered comparable in so far as the influence of seasonal conditions may affect the composition.

Mangels.—The series analysed comprised thirteen samples representing eleven varieties grown from seed produced at Charlottetown, P.E.I., Ottawa and Guelph, Ont., Kentville, N.S., Steveston, and Agassiz, B.C.

MANGELS—1918.

	Dry Matter	Sugar in Juice.
Maximum	13·76	7·82
Minimum	9·73	2·84
Average for 13 varieties	11·78	6·13
" 14 years	11·03	5·73

The richest root contained 13·76 per cent dry matter and 7·82 per cent sugar in juice; the poorest in the series, 9·73 per cent and 2·84, respectively. These results are significant, representing as they do differences of no small magnitude in feeding value. The six varieties first in the series as to nutritive value were Yellow Leviathan, Gate Post, Yellow Intermediate, Royal Giant, Mammoth Long Red and Danish Sludstrup: all these were from Canadian grown seed and all contained over 12 per cent dry matter and 6·5 per cent or over, sugar.

Influence of Heredity in Mangels.—For nineteen years the "Gate Post" and "Giant Yellow Globe," two well known varieties, representing very distinct types of mangels, have been grown side by side at Ottawa and analysed, the object being to learn how far their composition may be influenced by transmitted character.

It is significant that throughout the whole period, without a single exception, the Gate Post has proved the superior variety. The summarized data are as follows:—

GATE POST AND GIANT YELLOW GLOBE MANGELS.

	Dry Matter.	Sugar in Juice.
Gate Post—1918 crop	12·87	7·22
" average for 19 years	11·77	6·17
Giant Yellow Globe—1918 crop	9·73	2·84
" " " average for 19 years	9·57	4·53

In these results we have satisfactory evidence that distinct varieties are able to transmit, in a marked degree, qualities or characters as to composition. The data further indicate that differences in feeding value of very considerable importance may exist and remain practically constant between varieties.

Turnips.—The series contained sixteen samples, representing twelve distinct varieties. Twelve of the fourteen samples were from Canadian grown seed, the localities of production being: Steveston, B.C., Ottawa, Ont., Cap Rouge, Que., Fredericton, N.B., and Kentville, N.S.

SWEDE TURNIPS, 1918.

	Dry Matter.	Sugar in Juice.
Maximum	12·62	8·02
Minimum	10·12	6·61
Average for 16 varieties	11·18	1·06
" 13 years	10·37	1·23

The averages, both for dry matter and sugar, are unusually high, partly due we presume to the small size of the root (average weight of one root—6 ounces) and partly to the favourable character of the latter part of the season for the development of sugar.

The summarized data in this investigation are presented in the following table:—

AVERAGE COMPOSITION OF MANGELS, TURNIPS AND CARROTS.

	Period.	Dry Matter.	Sugar in Juice.
Mangels	14 years.	11·03	5·73
Turnips	13 "	10·37	1·23
Carrots	13 "	10·67	2·22

The season of 1918 at Ottawa was evidently favourable to the development of a rich root. This is shown by the fact that the percentages of dry matter and sugar in all three classes—mangels, turnips and carrots—are higher than the averages obtained from the investigation to date.

The general conclusion from the 1918 results confirms that of the previous season, that the field roots from Canadian grown seed have proved fully equal, if not superior, in feeding value to those from imported seed.

FEEDING STUFFS.

The feeds sent in by farmers for analysis and report during the year included mill feeds or chops, bran, shorts or middlings, ground screenings, cotton seed meal, oil cake meal, sugar beet meal, fish meals, brewers grains and combings, peanut meal, palm-nut cake meal and several calf meals.

One third of the samples received were oat products obtained in the manufacture of oatmeal or other breakfast foods. Though some of these feeds were of fair quality, (free from excess of hull and in some cases containing corn or other grain) a number were exceedingly poor, practically worthless, consisting essentially of oat hulls. The data may be summarized as follows:

	Protein. p.c.	Fat. p.c.	Fibre. p.c.
Maximum	12·48	4·39	32·17
Minimum	1·40	0·53	8·94
Average	7·64	2·65	20·58

The larger number of these feeds have been put on the market as a result of war conditions, which have greatly advanced the price of all feeding stuffs. Our analyses show a great variation in composition and unfortunately their feeding value cannot always be guaged by mere inspection. Especially is this true as regards those that are put upon the market in a finely ground condition. As many of them are sold at prices at little if anything below those of standard feeds, e.g. bran, shorts, etc., they should not be bought except on guaranteed analysis or a guarantee as to their real nature.

The list of feeds examined is too long to permit in this summary the inclusion of analytical and descriptive details, but information will be gladly furnished to those interested as to the composition of feeds on the market, as far as our data will make it possible.

In order to obtain a more complete knowledge of the feeding stuffs on the Canadian market, a series of samples has been collected throughout the Dominion. The series, comprising feeds of all kinds contains over 400 samples and is now in course of analysis. The completed work, owing to its extensive nature, should prove of particular value to farmers and stockmen generally. It is expected to publish the details in bulletin form and that the matter will be available for writing up during the present summer.

GRASSES.

A large series of cultivated-hay and pasture-grasses grown on the Central Experimental Farm, is in course of analysis. This work, which has been undertaken at the

instance of the Division of Forage Plants in connection with grass breeding experiments will furnish information as to the relative nutritive value of the grasses and also as to the stage of growth at which the grasses should be cut for hay.

MOISTURE CONTENT OF ROOT SEEDS.

For the safe storage of seeds—that they may neither mould nor heat— it is essential that they should not be moist or damp when put away in bags or bins. Assistance in this matter has been rendered the Division of Forage Plants and the moisture content of 154 samples of Canadian grown seeds—mangels, turnips, carrots—determined.

FLOUR.

The official examination as to moisture content of flours purchased in Canada by the British War Office, was entrusted to the Division in 1915 and has been carried on continuously since that date. In 1917 the Wheat Export Company were appointed the "Official Agents of the Allied Governments" and took over the purchasing of the flour for civilian and military use overseas. To this body our results are now reported.

More than 4,000 samples were submitted for analysis during the year. This has entailed a very large amount of analytical work but the results have been of great value to the Empire and the Allies, not only in effecting an enormous saving—amounting to tens of thousands of dollars—but in controlling the moisture content of the flour and thus ensuring its good keeping qualities under conditions of transportation and storage.

MEAT INSPECTION DIVISION.

The work in connection with the examination and scientific control of packing houses and canning products, submitted by the Meat Inspection Division, Health of Animals Branch, for the year 1918-19, has included 2,691 samples, the classification of which may be given as follows:—

Lards, tallows, oils, butters and oleomargarine	329
Preserved meats	10
Colouring and dyestuffs	3
Preservatives	36
Spices and condiments	2
Evaporated apples and apple waste	680
Condensed milks	1,514
Miscellaneous	117
	2,691

The new feature of commercial interest in the work has been the chemical and physical examination of a large number of samples of condensed milk. In addition to the determination of total and milk solids, butter fat, etc. incubation tests have been made in order to obtain evidence as to presence or absence of bacteria, moulds, yeasts, etc. This work has been carried out in as practical and thorough manner as possible, and its results, it is considered, have been of value in a more careful and rigid control in the manufacture of the milk, more particularly as regards net weight in tins, "thickened" and "sandy" milk and mould contamination.

A considerable amount of investigatory work has been done in the examination of oils for denaturizing inedible fats and as a result it is thought that the consumer will be more thoroughly protected in this respect in the future.

Preliminary work of an investigatory character has been carried out to ascertain the cause of the dark colours sometimes encountered in canned corn. This inquiry will be continued next year with the co-operation of the packers.

STAMP CANCELLING INK.

At the request of the Postmaster General a chemical and physical examination was made of the inks at present in use by the Post Office Department with view of determining their suitability for cancelling stamps. The nature and proportions of the various ingredients were ascertained and the nature and indelibility of the impressions therefrom were rigidly tested.

The Division, as a result of this preliminary work, has devised an ink which is at present under practical test by the Post Office Department. In composition and properties it differs widely from the inks now in general use, possessing, it is considered, better physical properties and far greater relative indelibility. At the time of writing a final report on this ink has not been received from the Post Office authorities.

WATERS FROM FARM HOMESTEADS.

That there is no more important and valuable asset on the farm than an ample supply of pure water is a fact largely recognized to-day throughout the length and breadth of the land. In considering the purity of any particular supply we wish to point out that while there are many well waters so seriously polluted as to need no analysis to condemn them—their condition at once stamping them as polluted—there are on the other hand many that are unsafe and dangerous and yet remain inoffensive to sight, smell and taste. It is for these that analysis is particularly necessary to discover their true nature. A water may be bright, clear and odorless and yet highly polluted. Our work has shown that it is the improperly placed shallow well that is most to be feared; at any time it may become a source of danger to the health of the farmer, his family and his live stock. If there is no natural, pure source available, the safest supply is the deep driven or drilled well so located as to be beyond the possibility of local contamination.

The waters examined during the past year may be classified as follows: pure and wholesome 33 per cent; suspicious and probably dangerous 15 per cent; very seriously polluted 29 per cent and too saline to be potable 33 per cent.

The analysis of a farmer's water supply is made free of charge but express charges on the sample must be prepaid. Those desirous of availing themselves of this offer should first obtain from the Division of Chemistry an application form which gives directions as to the collection and shipment of the sample.

DIVISION OF BOTANY.

REPORT OF THE ACTING DOMINION BOTANIST, J. H. GRISDALE, B.Agr., D.Sc.A.

DESTRUCTIVE INSECT AND PEST ACT.

The white pine blister rust investigations as well as the potato inspection carried on during the year, have been continued by the use of funds voted under the Dominion Destructive Insect and Pest Act. The following is a brief summary of the work carried on with this appropriation.

WHITE PINE BLISTER RUST.

Scouting.—During 1918 an attempt was made to ascertain the extent of the disease outside Ontario and Quebec. The results for the season indicated no disease in British Columbia, Manitoba and Saskatchewan, Northern Ontario and New Brunswick. In the Niagara Peninsula the disease was present as usual. In Quebec, blister

rust was reported on the north bank of the St. Lawrence, but none in the Ottawa valley or along the International boundary line. The results of the scouting in 1918 would indicate that the disease is still confined to Southern Ontario and Quebec.

Control Areas.—During the summer, four experimental control areas were established, one in the Niagara Peninsula near Fenwick, one at Bowmanville on the north shore of Lake Ontario, one at Carillon near Montreal and one at Berthierville, in Quebec. A fifth area was planned for Lotbiniere county in Quebec, but could not be completed. In the four areas mentioned all wild and cultivated ribes were removed from the pine woodlots and around them for a distance of 500 yards. Observations in various localities indicate that the infection will not readily cross a strip of this width.

Damage to Pines.—In order to determine the damage which has already resulted from the disease in those districts which are known to have been infested for some years, a limited pine survey was made in Ontario during the summer. This survey covered only the trees in woodlots up to ten or twelve feet in height. All these trees were counted and a record made of all those which bore blister rust infections. While there is considerable variation in different woodlots, the total percentage of infection is rather small; in the Niagara Peninsula 270 pines were found to be diseased out of 11,279 examined in 22 woodlots. Three of these woodlots showed no disease, and the general percentage of infected pines is only 2·3 per cent. In the Oakville district and in Simcoe county, some 2,849 pines were likewise examined in 13 woodlots. Only one diseased pine was located in these. Since the general conditions, especially in the Niagara Peninsula, are quite favourable to the spread of the disease owing to the immense number of wild ribes and cultivated black currants, the comparatively small amount of pine infection found after at least four years of exposure leads us to hope that, under favourable conditions, losses from the disease may be kept at such a minimum that the growing of pines on a commercial basis will still be possible.

It is apparent from the results of this survey that these factors are concerned in infection of pines:—

(1) The nearness of cultivated ribes, particularly black currants.
(2) The number of wild ribes present.
(3) The moistness of the situation.

It has been found that on swampy land, wild ribes are plentiful and luxuriant, and become infected very completely, while in higher and drier situations they are less plentiful and the infection is often negligible.

Research.—Some very interesting results were obtained by Mr. Geo. H. Duff on the effect of ultra-violet light and sunlight on the æcidiorspores and uredospores of the blister rust fungus. Exposure to ultra-violet light for a short time (2½ minutes) was fatal to the germinating capacity of these spores. When exposed to sunlight under glass however, they survived exposures as long as five hours.

In continuation of the work done last year on the rate of fall, in still air, of the uredospores, a similar determination was made on the rate of fall of the æcidiospores of the rust fungus. It was found that the rate of fall was practically the same for both, the æcidiospores dropping in still air through a distance of eight feet in a little over seven minutes. If this result is considered in connection with the rate of motion of an ordinary breeze, it becomes evident that these spores can readily be carried to distances of many miles.

POTATO INSPECTION.

Potato inspection and certification was conducted in the following provinces: Prince Edward Island, Nova Scotia, New Brunswick, Quebec and Ontario. Fields to the number of 3,288, comprising 9,996 acres, were inspected for seed purposes, and 989

fields, comprising 2,920 acres, were passed as fit for No. 1 seed. Up to December 31, 1918, 43,500 bushels of No. 1 seed had been shipped at prices about 50 per cent in excess of the price of table stock.

An extensive survey was made in Southern Ontario to determine the extent to which seed-borne diseases were present. This work extended to 1,336 fields, made up of 2,339 acres in 32 counties, and disclosed the presence of very large percentages of leaf roll and mosaic; diseases which reduce the yield to about one-third and two-thirds of the normal, respectively. A preliminary survey was also made in Manitoba and Saskatchewan, which disclosed the need for further work.

FIELD LABORATORIES.

St. Catharines.—Following one of the severest winters on record, which caused considerable injury in orchards, spring and summer were normal until about July, when pronounced drought set in. The conditions in fall were cooler, with more precipitation.

The white pine blister work, which, owing to the location of this field laboratory within the zone of infection, is carried on under the immediate supervision of the officer in charge, is reported on briefly under the section "Destructive Insect and Pest Act."

Among the principal investigations of this laboratory may be mentioned Brown Rot of Stone Fruits, Strawberry Mildew, Raspberry Leaf Curl, Silver Leaf, and Bacterial Leaf Spot of Peach.

Besides the numerous addresses on various phases of plant diseases usually given during the winter, a series of illustrated addresses on plant diseases was arranged for the Agricultural Short Courses in various counties. In addition, a more comprehensive course on the subject, consisting of ten lectures and four laboratory periods, was put on for the Agricultural Short Course held in St. Catharines. The results of this more extended course were very encouraging, and it is hoped that more work of this kind can be attempted in future years.

A series of press articles on various subjects pertaining to plant diseases was prepared during the year, and there were also issued two bulletins, one of Peach Canker (No. 37, Second Series), and one on Tomato Diseases (No. 35, Second Series). In addition, a section on strawberry diseases was written for inclusion in a strawberry bulletin to be published by the Division of Horticulture.

Charlottetown, P.E.I.,—Experiments and Laboratory Investigations on Potato Diseases.

Experiments on leaf roll showed that the disease can spread at an alarming rate in the field, even under conditions as favourable for potatoes as those at Charlottetown.

A series of experiments on leaf roll and mosaic was begun, in collaboration with the Central Laboratory at Ottawa and the respective Superintendents at Charlottetown, Kentville, Nappan, Fredericton, Lennoxville, Brandon and Indian Head, as well as on a private farm at Fort William, Ont. Other investigations dealt with curly dwarf, wilt diseases and powdery scab.

Potato spraying demonstrations were conducted on twenty-one farms in Prince Edward Island with a horse-power and a hand-power sprayer. The growers who used the former machine estimated that their yields were increased on the average by 77½ bushels per acre, and those who used the latter estimated the increase at 40 bushels on the average. In addition to this, the amount of rot was cut down from as high as 40 per cent of the crop to practically nothing.

A demonstration on a large scale was conducted at the Experimental Station, Charlottetown, on the control of loose smut of wheat and barley with hot water. The amount of smut was reduced from as high as 65,000 heads per acre, to very small proportions.

The officer in charge delivered a number of lectures, and otherwise interested himself in extension and demonstration work. Several meetings were attended.

A report on potato inspection and certification, carried on under the supervision of the officer in charge, is reported under the section "Destructive Insect and Pest Act".

Fredericton, N.B.—The following are the chief lines of work carried on during the year: Field and laboratory research on the control of bean, pea, potato and wheat diseases; a study of methods for storing turnip stecklings in order to avoid rot; a preliminary field survey of root and vegetable diseases in New Brunswick, Quebec and Ontario; a forest disease survey and study of some of the more important forest diseases in New Brunswick and Quebec, for the purpose of locating good seed; inducing and assisting farmers to maintain potato seed plots for the control of potato diseases; potato spraying demonstrations.

Experiments on hand-selection, seed treatment, varietal resistance and spraying for the control of bean anthracnose, and a similar series of experiments dealing with leaf spot and root rot of peas, have given promising results.

Storing turnip stecklings.—Great quantities of turnip stecklings stored in the fall of 1917 for seed production, rotted in storage or failed to grow after being set in the field. This condition appears to have been brought about by over-heating in storage. Experiments commenced last fall, including storing stecklings in barrels, crates, bins of different dimensions, and three forms of field pits, indicate that they may be most safely and economically stored on shelves 12 to 15 inches deep in a well ventilated cellar where the temperature is held below 35 degrees F.

Glume Spot of Wheat (Septoria glumarum Pass).—Investigations on glume spot of wheat included 82 plots consisting of experiments on date of planting, source of seed, good and poor seed, varieties, seed treatment and soil treatment. The results, while inconclusive, emphasize the importance of planting early and using good seed in the localities where disease is likely to occur.

Potato Inspection.—During the summer, 3,020 potato fields were inspected in New Brunswick and Quebec.

GRAIN DISEASE RESEARCH.

Work was carried on during the summer of 1918 chiefly at the Brandon laboratory.

Miss Margaret Newton carried on greenhouse cultures at Manitoba Agricultural College for a few months during the summer under the direction of the Brandon laboratory, chiefly to determine the relationship of the stem rust in the native and wild grasses to that of the wheat rust. She also aided in field observations on grain rusts and other diseases.

The work at Brandon consisted chiefly of experiments and observations with the object of determining the method of wintering, and spread of the stem rust (*Puccinia graminis*). Some attention was given to locating the common barberries in Western Canada and the part played by these shrubs in the spread of the stem rust.

Experiments were also carried on to determine the life history and method of control of the stripe disease of barley (*Helminthosporium gramineum*) and the smut of western rye grass.

The season at Brandon was very dry and the experimental plots were so severely injured that the results of the experiments were seriously affected.

There was a considerable development of rust in Southern Manitoba, and much injury was done to late grain. Some experiments were tried to determine the best time for cutting severely rusted wheat, but the results were not conclusive.

Experiments were also undertaken to determine the life history of the leaf rust of wheat (*Puccinia triticina*) and its relation to the closely allied rust on many grasses.

In concluding the report, mention may be made of the free distribution of nitro-cultures prepared at the Central laboratory, which was continued during the year. Reports received from the users of our cultures throughout the Dominion, confirm the opinion that their use is beneficial to leguminous crops. The benefits indicated are, earlier maturity, better stands, larger yields and, in the case of alfalfa, increased resistance to winter killing. However, the very severe winter caused great damage to fields; many reports tell of promising stands having been frost-killed or ruined by prolonged wet spells.

In addition to the regular routine and increasing executive work, the Central laboratory commenced a study of the effect of chemical treatments of ergot grain as a means of eliminating any danger from the presence of ergot in seed grain.

Interesting results were also obtained from experiments relating to the control of leaf stripe of barley (*Helminthosporium gramineum*). This disease appears not to respond appreciably to the usual methods employed in treating seed grain.

The work in connection with a comparative study of the organism causing common scab in potatoes, and several other investigations are being continued.

GENERAL AND SYSTEMATIC BOTANY, 1918-19.

During the year there were the usual enquiries about weeds, poisonous plants, medicinal plants, etc. About 629 specimens of plants were received for identification. Among the miscellaneous enquiries were letters relating to cocoa-nuts, olives, and Sphagnum moss.

Some additional specimens were added to the herbarium, and considerable additions were made to the collection of living plants in the arboretum. Special mention deserves to be made of the American Lotus (*Nelumbo lutea*), living roots and dried specimens of which were donated by Mr. A. H. Richardson, St. Williams, Ont.

Copies of our annual exchange list of seeds were sent to 52 of the leading botanical gardens throughout the world. During the year 649 packets of seeds and roots were sent out to various persons in Canada and to foreign botanical gardens and 347 packets of seeds were received.

Climatic tests were again carried out with Castor Oil bean (3 varieties), Soy bean (4 varieties), hemp, sunflower, black mustard, white mustard, lentil, Chick pea, fenugreek, and opium poppy all of which ripened seeds satisfactorily.

Press articles on chicory, Soy beans, the control of weeds by chemical sprays, and various other topics were prepared and a bulletin on the poisonous plants of Canada, by Miss F. Fyles, was handed in for publication.

THE CEREAL DIVISION.

REPORT OF THE DOMINION CEREALIST,
CHAS. E. SAUNDERS, B.A., Ph.D.

THE SEASON.

To the erratic weather conditions of the 1918 crop season that prevailed over large areas of Canada must be attributed the low yields of cereals in some of the greatest grain-growing provinces. In British Columbia, Prince Edward Island and Nova Scotia, the conditions more nearly approached the normal, although in certain portions of British Columbia damage was caused by drought in the early part of the season. Throughout the prairie provinces, most unusual weather prevailed. Seeding was accomplished under favourable conditions, but May, June and the early part of July were much too dry, and in consequence all grain growth was seriously injured. Light rains in July partially offset this disadvantage, but a heavy frost on July

24, 25 and 26, swept the northern sections, and practically ruined a large part of the crop. The southern parts of the provinces escaped lightly, and abundant rains at the end of July assisted materially in the improvement of the yield.

In Ontario seeding conditions approached the normal. Harvesting weather was favourable until the latter part of August, when heavy rains set in and prevented the successful handling of all late sown grains. At the Central Farm, the seeding was done promptly in the spring, and harvesting was completed before the worst of the rainy period arrived.

Throughout the eastern provinces the season was rather cool and backward but good yields were generally obtained, though the quality of the crop was often lowered by excessive rain. Prince Edward Island had an exceptionally fine crop.

NEW VARIETIES OF CEREALS.

Ruby Ottawa 623, spring wheat which was introduced last spring, suffered severely, as did all other grains, in some of the districts to which it was sent. The unusual drought and frost caused many failures but in spite of these drawbacks Ruby did well in other instances, and in some cases seemed to show special ability to resist frost. This variety, while not exactly drought-resistant, does not seem to be specially susceptible to drought. During the past winter, a large number of samples have been sent out. This variety has already shown its suitability for some of the northern sections of Canada where Marquis ripens too late. In districts where wind is not feared, Ruby will have the additional advantage of threshing out more easily than Marquis, though, of course, in windy districts this means that Ruby cannot be allowed to stand as long in the field uncut as Marquis. A certain amount of Ruby was available this season for sale as seed to those farmers who wished to start with a larger quantity than the usual free sample.

The new hulless oat, Liberty, Ottawa 480, which was announced a year ago, was distributed in very small quantities last spring as the stock of seed on hand was strictly limited. This winter the amount of seed was still small but samples were available for quite a number of farmers in different parts of Canada who were anxious to obtain this remarkable and promising variety. The indications are that the Liberty oat will prove a very valuable addition to the varieties grown in this country and will fill a distinct gap. The most encouraging reports received, as the results of last season's tests, were from Langley Fort, B.C. (Mr. Chas. E. Hope), and from Hathersage in northern Alberta (Mr. J. G. Hicks). Mr. Hicks' plot yields at the rate of about 64 bushels per acre, equivalent to about 91 bushels per acre of a variety retaining its hull. These oats withstood very well the severe frost which occurred at the end of July. Arrangements have been made to grow a larger area of Liberty oats this season so as to have a quantity more nearly adequate to meet the demand next year. The value of this variety as a cheap source of excellent feed for young chickens and young pigs is making it eagerly sought for.

Another new variety about which not much has yet been said is Albert, Ottawa 54, barley. This is an extremely early ripening six-row sort which is valuable whenever maximum earliness is required. In spite of being so early it gives a very fair yield of grain and it is hoped that it may prove particularly useful in combating wild oats in the Prairie Provinces. Albert has been derived by selection from a cross-bred barley produced in the early history of the Experimental Farms.

A new strain of beans selected from a variety obtained many years ago from Norway is now being introduced under the name "Norwegian, Ottawa 710." This is a yellowish brown bean of medium size and rather long in shape. It is extremely early in ripening, usually requiring ninety days at Ottawa. It is expected to prove valuable in many districts in Canada where the cultivation of beans has not yet been taken up. A few samples only of this sort were sent out but arrangements are being made for a larger distribution next season.

A new selected field pea under the name of Mackay, Ottawa 25, has been derived from the Mackay variety which was originated at Ottawa many years ago. This pea has proved remarkably productive and, although somewhat late in ripening, it is early enough for most of the well-settled sections of Canada. The distribution of this variety will not be possible for a year or two yet as the quantity of seed on hand is still very small.

A new flax selection under the name of Novelty, Ottawa 53, will, in all probability be available for distribution next winter. This variety has shown exceptional productiveness for seed purposes. Another selection also made by the Dominion Cerealist to which the name Longstem, Ottawa 52, has been given, is extremely promising for fibre production. The tests which have been made show that it is of the very finest quality for fibre purposes though it does not give a large crop of seed and is not recommended at all for seed production. It is hoped that the distribution of the Longstem flax will be possible next winter.

OLD VARIETIES REJECTED.

The duty of encouraging the growth of the best varieties seems to imply the duty also of endeavouring to discourage the farmers from growing varieties which have been shown to be inferior. From time to time, therefore, announcements are made advising the farmers to discontinue the use of some well-known sort. Some time ago it was announced that the oat called Abundance, or rather the variety most commonly grown under the name—for there seem to be at least two sorts so called—had been sufficiently tested and found not quite equal to the best standard sorts such as Banner. The farmers were therefore advised to discontinue it. This year the tests of White Fife wheat were regarded as complete and advice has been sent out to the effect that this variety should no longer be grown under ordinary conditions as it has no advantage whatever over Red Fife, and Canadian red wheats usually find a better market than white varieties. The Cerealist is aware that in attacking varieties which are popular in certain parts of Canada he has a difficult task before him. Nevertheless it seems to be an integral part of his work, because the best progress can never be made by the introduction of new varieties unless the farmers can be persuaded to discontinue the growing of the old, inferior sorts.

DISTRIBUTION OF SAMPLES OF SEED GRAIN.

There is an increase this winter in the number of free samples sent out, arrangements having been made to enlarge the distribution somewhat, as it was felt that the wishes of the farmers should be more fully met than they have been in recent years. It is a pleasure to record the fact that, as time goes on, the applications received from the farmers are decidedly improving in quality, more information being given to us and the needs of the applicants being more clearly stated so that we are in a position to choose more intelligently a variety likely to give satisfaction. While some of the seed for distribution this year was not as plump as usual, owing to the excessive drought in central Canada where some of the grain was grown, nevertheless most of our grain was of very good appearance besides being of the highest standard of purity and of unexceptionable pedigree. The seed for the distribution of the past winter was obtained from the following experimental farms: Indian Head, Sask., Rosthern, Sask., Brandon, Man., Cap Rouge, Que., Ste. Anne de la Pocatière, Que., and the Central Experimental Farm at Ottawa.

TESTS OF VARIETIES OF CEREALS.

The usual cereal tests were conducted at Ottawa and at the majority of the branch Experimental Farms and Stations. The results obtained were satisfactory in some

instances but very severe weather conditions and other causes reduced the value of the tests at several of the Stations. In order to prosecute the work of the Cereal Division more rapidly it would be advantageous to enlarge greatly the scope of these tests and to provide more expert assistance for the supervision of the work and the taking of the necessary notes during the growing and harvesting season.

GRAIN PLOTS AT OTTAWA.

In order to give some idea of the amount of work which is being done, the following particulars are presented in regard to the varieties and selections under test at Ottawa last season. In the regular tests there were 290 plots of spring wheat, 23 of emmer and spelt, 84 of oats, 274 of barley, 6 of rye, 31 of flax, 41 of beans, 72 of peas and 86 of buckwheat, making a total of 907. Besides these regular plots of $\frac{1}{120}$ acre, there are still smaller plots of unfixed cross-bred varieties and of fixed varieties and new strains which are in the early stages of propagation, of these there were as follows: 212 small lots of varieties not fixed and 754 small lots of varieties for propagation. Furthermore, in the larger propagation areas, where the varieties intended for test at the branch farms and for distribution to the public are being grown, there were 37 plots.

The total number of plots of all sizes was 1910.

MILLING AND BAKING RESEARCHES.

The usual milling and baking work with new wheats from the test plots of cross-bred and selected varieties at Ottawa occupied the greater portion of the time of the assistant in milling and baking. The most promising sorts grown at the Branch Farms were also tested including wheats from Lacombe, Alta., Beaverlodge, Alta., Indian Head, Sask., Brandon, Man., Ste. Anne de la Pocatière, Que., and Nappan, N.S. This test work involved the milling and baking of 100 varieties. Experiments with substitute cereal flours were continued, it being found that the majority of cereal flours and meals could be made up to twenty per cent. in the production of a loaf with little or no detrimental effect on the quality of the product. Samples of loaves containing 20 per cent of other cereal flours were exhibited at the Central Canada Exhibition at Ottawa. Many questions were asked and advice given by the assistant in charge as to the use of substitute flours in bread making and methods of using "government standard" flour.

A new series of experiments on the effect of age in flours and wheats was started in 1918. Millings made as soon after harvest as possible and also two months after harvest furnished the bulk samples of flours for storage. Unmilled wheats of the same lots were also placed in storage at the same time, portions of these samples will be milled and baked at the same times as the stored flours. This experiment is planned to cover a period of 18 to 20 years, results of previous tests having shown that both wheat and flour can be kept in excellent condition for at least 12 years.

An experiment on the cutting of wheats at different stages of maturity was also carried out. These cuttings were made 12 and 4 days before the wheat was ripe, on the day when ripe and 5 days after ripening. All samples were milled at the same time and baked together. The results were somewhat variable, but showed a gradual improvement in strength of flour as the date of maturity was approached. This experiment will be repeated.

During the year April 1, 1917, to March 31, 1918, 122 samples of wheat were milled and 810 test loaves were baked, 120 of these being tests with substitute flours of various proportions.

DIVISION OF FORAGE PLANTS.

REPORT OF THE DOMINION AGROSTOLOGIST, M. O. MALTE, PH.D.

Owing to the necessity of devoting a very large proportion of time and energy to the production of field root seed on a commercial scale for the purpose of safeguarding against a threatening shortage in the supply, the division found it impossible to proceed with much of its usual work in a normal manner. Variety tests were conducted with mangels, swede turnips, carrots, and sugar beets as usual, although on a much reduced scale, but the breeding of grasses and clovers which, on account of its very nature, requires much detail work calling for time-absorbing manipulations and observations, had of necessity to be very much curtailed. However, some of the phases of the breeding work, viz: such as required the least amount of detail work, were followed up and will be reported upon in the following.

VARIETY TESTS.

A total of 32 varieties of field roots, including 16 varieties of swede turnips, 13 varieties of mangels and 3 varieties of field carrots, were tested at the Central Experimental Farm.

The season was very unfavourable to swede turnips and, as a result, the yields obtained were very low, the average of 16 varieties being 10 tons 868 pounds to the acre. Mangels did better, the average of 13 varieties being 28 tons 1,453 pounds. Carrots gave very heavy yields; the average of three varieties was not less than 31 tons 266 pounds per acre, one of the chief reasons for this heavy yield being that the carrots were allowed to grow very thickly.

In respect to the quality of the commercial varieties the same observation was made this year as the two last ones, i.e. that most of the so-called varieties were deplorably lacking in uniformity and, in many instances, were so badly off-type that the true type of the variety which the name indicated could be found only in a very small percentage of the roots.

FIELD ROOT SEED GROWING.

Yield per acre under different conditions.—Previous experiments conducted with mangels have shown that the yield of seed per acre is greatly influenced by:—

1. When the seed roots are planted, and
2. The state of fertility of the soil.

It has thus been found that the best and heaviest mangel seed crops are obtained when, other conditions identical, the seed roots are planted as early in the spring as possible. It has further been shown that the yield per acre is greatly increased if the land is in a good state of fertility, an application of a liberal amount of chemical fertilizer together with 15-20 tons of manure to the acre increasing the seed yield considerably when the land on which the seed is being raised is somewhat low in fertility.

In order further to study the effect of factors influencing the mangel seed yield, an experiment was planned this year combining the use of different rates and combinations of chemical fertilizers coupled with different rates of manure, the planting of the seed roots at different distances, and the use of small and full-grown roots as seed roots. The experiment, which included a total of 96 plots, brought out, in the first place that an application of 20 tons of manure to the acre increased the seed yield most conspicuously, whether applied alone or in combination with chemical fertilizers.

Secondly, it demonstrated that close planting tends to increase the seed yield, whether full-grown roots or small ones are used as seed roots. Thus roots planted 3 by 1½ feet are apt to yield anywhere from 25 to 50 per cent more seed to the acre than roots planted 3 feet apart each way.

Judging from the figures secured, the results of the experiment seem also to indicate that heavier seed yields may be obtained when full-grown roots are planted to seed than when small ones are used. As such a finding, however, does not agree with what is commonly believed to be a fact, viz. that small roots give as good seed crops as large ones, the question will be further studied the coming year. Small roots may be capable of yielding fully as heavy seed crops in ideal soil and when the planting is flawlessly done, but, on the other hand, if the soil is heavy and apt to bake, and if at the same time the roots are planted a little too deep, the yields may be smaller because of the seed stalks having some difficulty in breaking through the surface of the soil.

Emergency Root Seed Production.—On recommendation of the Seed Commissioner, the Department instructed the Division of Forage Plants, in 1917, to arrange for the production of large quantities of mangel, swede turnips, and carrot seed, the same to be held available to the root seed consumers of the Dominion in case a shortage in the supply should develop. Accordingly, large quantities of stecklings were grown and harvested in 1917. They were planted in the spring of 1918 and, as a result, the following quantities of field root seed raised by the various Dominion Experimental Farms and Stations were offered for sale by the Division of Forage Plants at the beginning of 1919.

	Pounds.
Grown at the Central Experimental Farm, Ottawa—	
Yellow Intermediate mangel	14,000
Half Sugar White mangel	300
Purple Top Swede turnip	2,000
Danish Champion carrot	900
Grown at the Dominion Experimental Station, Kentville, N.S.—	
Danish Sludstrup mangel	500
Canadian Gem Swede turnip	18,000
Kentville Green Top Swede turnip	8,000
Grown at the Dominion Experimental Station, Nappan, N.S.—	
Monarch Swede turnip	7,000
Grown at the Dominion Experimental Station, Fredericton, N.B.—	
Sutton's Champion Swede turnip	800
Grown at the Dominion Experimental Station, Lethbridge, Alta—	
Yellow Intermediate mangel	900
Grown at the Dominion Experimental Station, Summerland, B.C.—	
Half Sugar White mangel	7,000
White Intermediate carrot	3,000
Grown at the Dominion Experimental Farm, Agassiz, B.C.—	
Half Sugar White mangel	1,000
Danish Sludstrup mangel	500
Grown at the Dominion Experimental Station, Sydney, B.C.—	
White Belgian carrot	300

The total amount of root seed offered for sale amounted to 65,200 pounds as follows:—

Mangel seed	24,300 pounds.
Swede turnip seed	36,700 "
Carrot seed	4,200 "

On further recommendation of the Seed Commissioner, the Division of Forage plants arranged, in 1918, to grow large quantities of stecklings of mangels, swede turnips, and carrots at those Farms and Stations where, according to experience, seed of the said field roots can be grown with a reasonable certainty, the said stecklings to be kept available for planting to seed in the spring of 1919 in case the commercial root seed supply situation should warrant further emergency root seed production by the Dominion Experimental Farms' System.

BREEDING WORK.

As already stated, the breeding work with forage plants had of necessity to be curtailed owing to the large amount of time and labour spent on emergency root seed production. Only the most elementary and least time-absorbing breeding work could be attended to and, for this reason, little progress can be reported. In the following a brief account will be given, however, of two cases of forage plant breeding, the more as they represent several year's work the results of which now begin to appear.

Breeding of Red Clover.—Actual breeding work with Red clover was taken up by the Division of Forage Plants in 1913 and was founded on the well-known fact that red clover displays an extremely high degree of variability. All so-called "varieties" of red clover consist, as a matter of fact, of a very great number of forms differing from each other not only in respect to characters easily discernible to the eye, such as mode of growth, stooling after cutting, shape of leaves, colour and shape of seed, etc., but also in respect to certain other properties which only close observations may reveal, for instance ability to withstand severe winters, and ability to live more than two years. Under the circumstances it follows that, if the various characteristics of the different forms are transmitted from one generation to the next one in accordance with the laws of heredity in plants, red clover should furnish abundant natural material for improvement work, and also that it ought to be possible to develop a very large number of new varieties.

However, on account of red clover plants refusing to set germinable seed, unless the flowers are cross-fertilized by pollen from other red clover plants, it is evident that the breeding methods which apply, for instance, to the self-fertilizing cereals cannot be used to the same advantage in red clover. Whereas it is a very easy thing to develop perfectly uniform and constant varieties of the cereals, it is extremely difficult to do so in red clover for the reason that every red clover plant is by necessity the result of a cross between two individual plants.

In planning the breeding work with red clover in 1913, the Division therefore decided to resort to a system of mass-selection whereby as uniform "varieties" as possible could be developed.

As it is of primary importance to red clover growers in Canada that the red clover used possesses what is called hardiness, that is to say ability to survive severe winters without being killed to such an extent that the yields are seriously affected, the Division started its breeding work with the object of developing, if possible, a winter-hardy strain. When this had been accomplished, the Division, it was planned, should go further and endeavour to breed, from within the winter-hardy strain, new varieties possessing qualities making them also in other respects superior to the so-called varieties obtainable through the trade.

When undertaking the breeding work for hardiness, the Division had also in view the developing, if possible, of a clover strain of a perennial nature, that is to say of a strain capable of yielding remunerative crops for more than one year. For this reason the breeding work was started with a few individual plants which, according to observations, had lived through at least four winters.

In 1915, some seed was gathered, and as it was thought to represent a hardy strain of a perennial nature, it was sown in test plots in 1916. In 1917, one hay crop and one seed crop were taken. In 1918, two satisfactory crops were again taken from the very same plants which yielded one hay crop and one seed crop in 1917, and, judging from observations in the early spring of 1919, a great majority of the plants which started life in 1916 will continue to live in 1919 also.

Under the circumstances the Division may be considered justified in claiming to have developed a perennial red clover, capable of producing full crops for at least two, and probably three, consecutive years.

This perennial clover is now being propagated for extensive comparative tests.

Western Rye Grass.—This grass, botanically known as *Agropyron tenerum* Vasey, has been closely studied, comparatively speaking, in its wild state for several years. It is of special interest not only on account of its value as a hay grass in the Prairie Provinces, but also botanically because it occurs in a vast multitude of forms, many of which appear to be connecting links between it and certain European and alpine-arctic species.

The first selection of Western Rye grass material for breeding work was made in 1912 when a few individual plants were collected at Indian Head, Sask. and brought to Ottawa for further study. Some of them were allowed to go to seed without any precaution being taken against possible cross-fertilization. When the plants coming from this seed develop, a surprisingly great uniformity was observed in the progeny of the individual mother plants. In other words, the Western Rye grass plants were breeding either perfectly true to type, or almost so..

In order further to ascertain whether the different forms of Western Rye grass and allied species normally breed true to type, a collection of ripe seed from individual plants was made in the fall of 1916 at Calgary, Alta., where, within areas of only a few square rods in size, dozens of different forms can be found growing topsy-turvy. The seed collected was, in fact, taken from plants representing widely different forms, which grew so close together that a person could collect the seed from two or three of them without moving.

The seed thus collected was sown at Ottawa in 1917, and later a number of the seedlings obtained were transplanted in rows, each row representing the progeny of one single plant. In 1918, when the plants had reached full size, it developed that, in all cases, the various forms selected at Calgary, 1916, as mother plants, were breeding true to type.

That the Western Rye grass forms should breed true to type was expected, for, according to observations made at Edmonton in the early summer of 1916, automatic self-pollination is the rule in Western Rye grass. In this respect the Western Rye grass behaves like wheat, to which it, as a matter of fact, is rather closely related botanically. Under the circumstances it follows that it will be just as easy to "breed" hundreds of distinct and constant varieties of Western Rye as it is to develop wheat varieties.

In order to secure suitable material for the breeding of Western Rye varieties adapted to different parts of Western Canada, a collection of living plants, representing about one hundred different types of Western Rye, was made in 1918. The various types, which were collected in Manitoba, Alberta, and in the Okanagan Valley in British Columbia, were shipped to Ottawa and transplanted. They all came through the winter of 1918-19 and will be used for practical breeding purposes, and also, as far as it can be accomplished, as material for studying the laws of inheritance of botanical characters in grasses.

DIVISION OF ILLUSTRATION STATIONS.

REPORT OF THE SUPERVISOR, JOHN FIXTER.

In 1918 seeding began about two weeks earlier than in 1917. The soil had plenty of moisture and was in a good state of cultivation. The seed germinated rapidly and made good growth until about June, when continuous dry weather, accompanied by very strong winds, checked the growth and in some cases caused a complete failure.

ILLUSTRATION STATIONS IN SASKATCHEWAN.

Assiniboia.—Operator, P. J. H. Warren. The season of 1918 opened up April 13. The soil was moist and in a fine state of cultivation. The grain germinated rapidly.

Although continuous dry weather prevailed through the growing season, fair crops were harvested. Wheat sown April 11 was harvested August 30, and Oats sown April 11 were harvested August 31. Two fields were summer-fallowed, costing $4.85.

	Yield per acre.	Standard Cost.	Actual Cost.
	Bu.	Cts. per bu.	$ ct per bu.
Wheat after fallow	41	·30	·36
Oats after oats	43	·26	·30
Wheat after fallow	13	·89	1·07
Oats after fallow	42	·29	·33
Wheat after fallow	17	·65	·80

Biggar.—Operator, Dr. S. E. Shaw. The season of 1918 opened up about the usual time, with a good supply of moisture in the soil. The seed was sown on a well prepared seed-bed and germinated readily. High winds and spring frost checked the growth. The exceptionally dry weather with frost July 24 was the cause of crop failure at this Station.

Davidson.—Operator, Reuben Lloyd. This Station was started in the spring of 1918. The land having been cropped previously, it was all summer-fallowed in 1917. The season of 1918 opened up for seeding April 26. The soil was in excellent condition with plenty of moisture. Seed germinated readily and made good growth. Wheat sown April 26 was harvested August 26 and oats sown April 29 were harvested August 30. Two fields were summer-fallowed in 1918, costing $4.48 per acre.

	Yield	Standard	Actual
Wheat after fallow	13 bu.	$1.03 per bu.	$1.22 per bu.
Wheat after fallow	15 bu. 12 lb	.78 "	.93 "
Wheat after fallow	9 bu. 12 lb	1.04 "	1.46 "
Oats after fallow	26 bu.	.40 "	.48 "
Oats after fallow	22 bu. 18 lb	.45 "	.52 "
Oats after fallow	27 bu.	.42 "	.50 "

Herbert.—Operator, Milton Holmes. Seeding began about three weeks earlier than in 1917. The soil was in excellent tilth. Although the moisture line was low, grain had to be sown deeper than usual. Wheat sown April 11 was harvested August 8. There was an exceptionally light rain-fall during the growing season, thus reducing the yield per acre. A heavy frost July 24 injured the quality and also lowered the yield of the grain. The value of extra good cultivation and good seed is more noticeable each season. Three fields were summer-fallowed in 1918, costing per acre $6.50, $6.26 and $6.02.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	10 bu.	$1.10 per bu.	$1.32 per bu.
Wheat after wheat	2 bu.	3.64 "	4.59 "
Wheat, seeded with Rye Grass	10 bu.	1.08 "	1.27 "
Oats after wheat	8 bu.	.90 "	1.08 "
Oats after corn and wheat	8 bu.	.73 "	.93 "

Lloydminster.—Operator, Hugh Hill. The spring opened up earlier than in 1917, with plenty of moisture in the soil. The grain was sown on a well-prepared seed-bed and made good growth up to July 24, when a heavy frost visited this district, shrinking the grain considerably and lessening the yield.

Two fields were summer-fallowed, costing $6.66 and $7.17 per acre.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	7 bu.	$1.66 per bu.	$2.06 per bu.
Wheat after wheat	Green feed.		
Wheat after fallow	11 bu.	$1.04 "	1.33 "
Oats after wheat, seeded	43½ bu.	.26 "	.30 "
Alfalfa	⅝ ton.	6.45 per ton	7.36 per ton
Western rye grass	⅝ ton.	6.02 "	6.93 "
Oats after corn and wheat	56 bu.	.19 per bu.	.22 per bu.

Maple Creek.—Operator, G. L. Hammond. Seeding commenced early. The seed-bed was in good condition and the soil had a fair share of moisture. Wheat sown April 9 was harvested July 31. Oats sown May 13 were harvested August 16. Continuous dry weather, along with high winds during the growing season, lessened the yield per acre. Good cultivation and good seed have shown their value in this section.

Two fields were summer-fallowed, one costing $6.26 per acre, the other $6.17 per acre.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	10 bu.	$1 15 per bu.	$1 45 per bu.
Wheat after wheat	1 "	6 14 "	8 34 "
Wheat after fallow, seeded with rye grass	10 "	1 17 ½ "	1 49 "
Oats after wheat	8½ "	1 22 "	1 45 "
Alfalfa grown for seed	33⅓ lbs.	20c. per lb.	22c. per lb.
Wheat after corn	2 bu.	3 68 per bu.	5 31 per bu.

Meota.—Operator, Walter Tait. The season opened up for seeding April 26. The soil, having been summer-fallowed in 1917, was in a good state of cultivation. There was a good supply of moisture in the soil and the grain germinated readily. Exceptionally dry weather set in and there was a severe frost July 24, causing a complete failure of the crop.

Moosejaw.—Operator, J. J. Glassford. The spring of 1918 opened earlier than in 1917. There was a good supply of moisture and the soil was in good tilth. The rainfall up to about July was light. However, with good seed and good cultivation, fairly good crops were harvested. Wheat sown April 10, was harvested August 28. Oats sown May 7 were harvested August 3.

Two fields were summer-fallowed, one costing $8.63 per acre and the other $7.46 per acre.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	22 bu.	55c. per bu.	66c. per bu.
Wheat after fallow	26 "	47c. "	57c. "
Oats after wheat, seeded	No crop.		
Alfalfa	"		
Western rye grass	"		
Oats after wheat and corn	32 bu.	27c. per bu.	34c. per bu.

Madison.—Operator, F. E. Halpenny. The season opened up three weeks earlier than in 1917. There was a good supply of moisture in the lower soil. The grain on this account had to be sown a little deeper than usual. There was good growth until the moisture was exhausted. Exceptionally dry weather set in from the time the grain was planted and lasted until harvest time, making crops almost a failure. There was a heavy frost July 24, which did considerable damage, particularly to the late growing grain. Wheat sown April 23 was harvested August 31 and oats sown April 25 was harvested August 24.

Two fields were summer-fallowed, one costing $6.81 per acre, the other $6.52 per acre.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after wheat	1 bu. 48 lbs	$4 06 per bu.	$5 26 per bu.
Wheat after fallow	11 bu. 12 lbs	1 05 "	1 28 "
Wheat after fallow	12 bu. 48 lbs	1 02 "	1 13 "
Oats after wheat	6 bu. 24 lbs	1 15 "	1 43 "
Alfalfa	½ ton.	11 41 per ton.	13 62 per ton.
Oats after wheat	8 bu.	0 74 per bu.	0 91 per bu.

Pambrun.—Operator, C. W. Appelgren. The season of 1918 opened earlier than usual. There was a fair supply of moisture in the soil. Seed sown germinated well and made good growth until the store of moisture was exhausted. The rain-fall throughout the growing season was exceptionally light and as a result crops were almost a failure. Wheat sown April 10 was harvested August 10 and oats sown April 26 were harvested August 9.

Three fields were summer-fallowed, costing per acre $6.87, $5.68 and $6.92, respectively.

	Yield per acre.	Standard Cost.	Actual Cost.
Oats after fallow	18 bu.	76c. per bu.	85c. per bu.
Wheat after fallow	No crop.		
Wheat after wheat	"		
Wheat, seeded rye grass	10 bu.	$1 20 "	$1 39 "
Hay	No crop.		
Corn after wheat	"		
Wheat after corn	"		

Prelate.—Operator, W. Huxtable. The season of 1918 opened up for seeding April 27. The soil was moist and in good tilth. The seed germinated readily, but, owing to the very high winds and continuous dry weather, very little growth was made. The summer-fallowed fields show the value of extra cultivation. Two fields were in summer-fallow in 1918, costing $4.98 per acre.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	7 bush.	$1 40 per bush.	$1 66 per bush.
Wheat after wheat	3 "	2 33 "	2 81 "
Wheat after fallow	6 "	1 64 "	1 95 "
Oats after wheat	No crop.		
Alfalfa	½ ton.	12 64 per ton	13 84 per ton.
Western rye grass	½ "	4 60 "	5 18 "
Oats after wheat and corn	⅓ ton for feed.	24 20 "	31 70 "

Radville.—Operator, Ernest Noble. Seeding began the first week in May. The soil was in good tilth and had a good supply of moisture. Wheat sown May 2 was harvested August 27. Oats sown May 14 were harvested August 19. Dry weather prevailed during the growing season. The value of conserving moisture is here shown by good cultivation and summer-fallow.

Two fields were summer-fallowed, costing $7.44 per acre.

—	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	20 bush.	68 cts. per bush.	82 cts. per bush.
Wheat after wheat	13 "	87 " "	$1 08 "
Wheat after fallow	19½ "	71 " "	82 cts. "
Oats after wheat, seeded with rye grass	37 "	33 " "	41 " "
Oats cut green	¾ ton.	$14.13 per ton.	$20.03 per ton
Western rye grass	1 "	7 89 "	8 69 "
Oats cut green	⅘ "	8 71 "	12 13 "

Shaunavon.—Operator, Neil McLean. The season of 1918 opened up early. There was plenty of moisture and soil conditions were favourable for growth. During the growing season the rainfall was very light and as a result yields were low. There is quite a noticeable difference in yields on fallowed lands and on lands where wheat was grown after wheat.

Two fields were summer-fallowed in 1918, costing $6.85 per acre.

—	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	15 bush.	$0.83 per bush.	$0 99 per bush.
Wheat after wheat	5 "	1.94 "	2 59 "
Wheat after fallow, seeded with rye grass	17 "	0.76 "	0.90 "
Oats after wheat	15 "	0.58 "	0.72 "
Alfalfa and western rye grass	⅘ ton.	8 55 "	10.02 "
Wheat after corn	15 bush.	0 71 "	0.87 "

Weyburn.—Operator, E. Meredith. The season of 1918 opened up earlier than in 1917. The soil was in excellent tilth and had a good supply of moisture. Grain sown germinated well and made good steady growth. Wheat sown April 13 was harvested August 21. Oats sown May 14 were harvested August 27. Although dry weather prevailed during the growing season, the value of good cultivation and good seed is marked.

Two fields were summer-fallowed, costing $7.01 per acre.

—	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	25 bush.	$0.45 per bush.	$0 56 per bush.
Wheat after wheat	20 "	0.62 "	0 74 "
Wheat after fallow	28 "	0 48 "	0.57 "
Oats seeded with rye grass	80 "	0 17 "	0 19 "
Oats after alfalfa	20 "	0.36 "	0 47 "
Western rye grass	½ ton.	8 14 per ton	8.34 per ton.
Oats after corn and wheat	80 bush.	0.07 per bush.	0 18 per bush.

Tugaske.—Operator, R. Wilson. The farm at this point on which the Illustration fields are located is owned and operated by R. Wilson. The farm adjoins the town and is situated on one of the leading roads. The soil is clay loam and represents a large area. This land had been previously cropped and was summer-fallowed in 1918, to be cropped as directed in 1919.

Zealandia.—Operator, W. M. Roberts. The farm at this point on which the Illustration fields are located is owned and operated by Mr. W. M. Roberts. It adjoins the town of Zealandia, on the main road leading to Rosetown. The area selected in the autumn of 1917 had been previously cropped and all was summer-fallowed in the season of 1918, to be cropped as directed in 1919.

ILLUSTRATION STATIONS IN ALBERTA.

Bassano.—Operator, R. H. Jones. The farm at this point on which the Illustration fields are located is owned and operated by Mr. R. H. Jones, and is situated on Section 9, Tp. 21, R. 18, W of 4. M. The soil is heavy loam cropped a number of years. It was fallowed in 1917, to be cropped as directed in 1918.

Bow Island.—Operator, M. Mortensen. The season opened up ten days earlier than in 1917, with only a fair supply of moisture in the soil. The grain was sown April 22 on a well prepared seed bed and germinated readily but made very little growth from May, throughout the season. It will be noticed that no crops were harvested except on land summer-fallowed the previous year. Five fields were summer-fallowed, costing per acre $5.91, $6.02, $6.59, $5.56 and $7.61, respectively.

—	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after wheat	No crop.		
Wheat after fallow	4 bush., 48 lbs.	$1 77 per bush.	$2.17 per bush.
Wheat after fallow	3 bush., 12 lbs.	2 44 "	2 89 "
Oats after wheat	No crop.		
Oats after corn and wheat	No crop.		

Carmangay.—Operator, W. H. Miller. Owing to changing the location of the Illustration Station at this point, it was found necessary to summer-fallow most of the land to be cropped in 1919. The cost of summer-fallow was $7.79 per acre.

Delacour.—Operator G. M. McElroy. The farm at this point on which the Illustration fields are located is owned and operated by G. M. McElroy and is situated on the north-west quarter of Section 24, Tp. 25, R. 28, W of 4 M., at the junction of two roads and quite close to the Grand Trunk Pacific Railway. The area selected had been cropped several years. In order to have uniformity it was summer-fallowed in 1918, to be cropped as directed in 1919. The cost of summer-fallow was $5.60 per acre.

Foremost.—Operator, T. H. Frankish. Seeding commenced April 15, which was about one week earlier than the previous year. The soil and climatic conditions were ideal. Unfortunately, following this date, there was very little rain-fall, causing almost no growth.

Two fields were in summer-fallow, costing $7.57 per acre.

—	Yield per acre.	Standard cost.	Actual cost.
Wheat after wheat	No crop.		
Wheat after fallow	7½ bush.	$1 50 per bush.	$1 81 per bush.
Wheat after fallow	7½ "	1 16 "	1 40 "
Oats after wheat	No crop.		
Western rye grass	"		
Alfalfa	"		
Wheat after corn and wheat	"		

Grassy Lake.—Operator, J. E. James. On April 13, soil and weather conditions were ideal for seeding. Wheat and oats germinated readily, making good growth

until June 15, when dry weather set in, almost completely destroying the crop.

Three fields were summer-fallowed, costing $7.46, $6.24 and $6.24, respectively.

	Yield per acre.	Standard cost.	Actual cost.
Wheat after fallow	11 bush.	$1 17 per bush.	$1 33 per bush.
Wheat after wheat	No crop.		
Wheat after fallow	9 bush.	1 24 "	1 44 "
Oats after fallow	No crop.		
Oats after wheat and corn	"		

High River.—Operator, B. F. Kiser. The spring opened about a week earlier than usual in this district. Soil and climatic conditions were ideal for spring growth. Wheat sown April 11 was ripe August 28. Oats sown May 2 were ripe September 3. The season throughout was very favourable for all kinds of crops.

Two fields were in summer-fallow, costing $6.50 and $5.52 per acre, respectively.

	Yield per acre.	Standard cost	Actual cost.
Wheat after fallow	28 bush.	$0 58 per bush.	$0 66 per bush.
Wheat after wheat	16 "	0 59 "	0 76 "
Oats after wheat	18 "	0 46 "	0 59 "
Wheat after fallow	21 "	0 50 "	0 60 "
Alfalfa	½ ton.	11 01 per ton.	14 68 per ton.
Western rye grass	½ "	7 34 "	9 78 "
Oats after fallow	45 bush.	0 34 per bush.	0 37 per bush.

Jenner.—Operator, Jerry Fisher. The season of 1918 opened up about 10 days earlier than in 1917, with plenty of moisture in the soil. Wheat germinated readily and made a good growth up to about June. Then owing to the extreme drought and heat, all kinds of crops ceased growing, thus causing almost a failure. Wheat sown April 18, was harvested August 16 and oats sown April 25 were harvested August 26.

	Yield per acre.	Standard cost.	Actual cost.
Wheat after wheat	1 bush.	$7 61 per bush.	$10 20 per bush.
Wheat after fallow	5 " 28 lbs.	1 56 "	2 05 "
Wheat on fallow	4 " 24 "	1 90 "	2 35 "
Oats on fallow	3 " 20 "	2 06 "	2 66 "

Macleod.—Operator, Norman Grier. Spring seeding began about the usual time. The soil and seed-bed were in excellent condition for sowing. The grain germinated readily and notwithstanding the dry season, fair crops were harvested. It is here interesting to note the difference in the yield per acre and the cost per bushel between wheat grown on fallowed land and that grown on land which had previously been in wheat.

Three fields were summer-fallowed, costing $5.15, $5.06 and $4.74 per acre, respectively.

	Yield per acre	Standard cost	Actual cost.
Wheat on fallow	16 bush. 24lb	$ 0 76 per bush	$ 0 87 per bush
Wheat after wheat	5 "	1 50 "	1 93 "
Oats after oats	10 "	0 69 "	0 81 "
Wheat after fallow	11 "	0 79 "	0 96 "
Alfalfa	½ ton	11 68 per ton.	14 38 per ton.
Western rye grass	Not cut.		

Magrath.—Operator, J. A. Meldrum. The season of 1918 was dry, although there was plenty of moisture to germinate the seed, which made good growth up to about June. The continuous dry weather retarded growth from that time and a light crop of wheat was harvested. Oats made a very weak growth and in some cases were not harvested. It was noticeable that the crops in the district of Magrath, as well as in the districts of Milk River and Foremost, where illustration stations are located, were better than those between these points.

Three fields were summer-fallowed, two costing $5.15 per acre and the third $5.75 per acre.

	Yield per acre.	Standard cost.	Actual cost.
Wheat after wheat	No crop		
Wheat after fallow	15 bush. 20 lb.	83c. per bush.	96c. per bush.
Wheat after fallow	11 " 12 lb.	79c "	95c "
Oats after wheat	No crop		
Oats after wheat and corn	"		
Oats after hay and corn	"		

Milk River.—Operator, B. L. Cornwall. Seeding began two weeks earlier than in 1917. The soil was in good condition. Seed germinated rapidly and made good growth up to about June 10. The soil was then almost exhausted of moisture and there was no rainfall, which condition caused very little further growth.

The rotations at this Station are being changed and will be in order in 1919. There were two summer-fallowed fields costing $6.50 per acre. It is noticeable here that well cultivated summer-fallow produced crops while grain sown after grain did not produce a crop.

	Yield per acre.	Standard cost.	Actual cost.
Wheat after fallow	7 bush.	$1 66 per bush	$1 96 per bush
Wheat after wheat	1 " 20 lb.	5 35 "	7 54 "
Oats after wheat	No crop		
Wheat after fallow	8 bush.	1 03 "	1 28 "
Alfalfa	No crop		
Western rye grass	"		

Munson.—Operator, R. R. Fraser. Seeding began about April 20. The soil was in perfect condition and germination was rapid. The grain made a good growth, regardless of continuous dry weather, and was ripe August 22, the quality of the seed being very good. Two fields were summer-fallowed, one costing $6.28 per acre and the other $6.30 per acre.

	Yield per acre.	Standard cost.	Actual cost.
Wheat after wheat	8 bush.	$ 1 07 per bush	$ 1 51 per bush
Wheat after fallow	26 "	0 55 "	0 63 "
Alfalfa	½ ton.	18 22 per ton	20 72 per ton
Western rye grass			
Oats after fallow	8 bush.	0 90 per bush.	1 14 per bush
Wheat after fallow	25 "	0 40 "	0 40 "
Oats after wheat and corn	40 "	0 17 "	0 27 "

Pincher Creek.—Operator, Sandgren and Carlson. Soil and weather conditions were ideal in this locality and spring opened up about the usual time. Crops made

good growth until about June 15, when dry weather set in, materially lessening the yield per acre. Wheat sown April 12 was harvested August 24. Oats sown May 8 were harvested August 28.

There were two fields summer-fallowed in this rotation, one costing $7.90 per acre and the other $8.43 per acre.

	Yield per acre.	Standard cost.	Actual cost.
Wheat after fallow	15 bush. 24 lb.	$ 0 96 per bush.	$ 1 16 per bush
Wheat after wheat	3 "	2.90 "	4 37 "
Oats after oats	No crop		
Wheat after fallow	20 bush. 48 lb.	0 55 "	0 69 "
Alfalfa	1,333 lb.	10.19 per ton	12.77 per ton.
Western rye grass	No crop.		
Oats after wheat and corn	18 bush.	0.51 per bush.	0.68 per bush

Taber.—Operator, I. L. Holman. Seeding commenced April 13. The grain germinated readily but owing to the lack of moisture in the soil and to the very light rainfall, scarcely any crop was harvested. Three fields were in summer-fallow, two costing $6.40 per acre and the third $5.82 per acre.

	Yield per acre.	Standard Cost.	Actual Cost
Oats on fallow	No crop.		
Wheat on fallow	1 bush. 24 lbs.	$7.52 per bush.	$8.83 per bush.
Wheat on fallow	1 bush. 24 lbs.	7 52 "	8.83 "
Wheat on fallow	No crop.		
Oats on fallow	No crop.		

Whitla.—Operator, R. H. Babe. Weather and soil were ideal for seeding and the grain germinated well, making good growth until June 15, when dry weather set in, almost completely destroying the crop.

Two fields were summer-fallowed, costing $7.10 per acre and $8.65 per acre, respectively.

	Yield per acre.	Standard Cost.	Actual Cost.
Wheat after fallow	5 bush.	$2 88	$3.32
Wheat after wheat	No crop.		
Oats after wheat	No crop.		
Wheat after fallow	7 bush.	$1.62	$1 93
Alfalfa	No crop		
Western rye grass	No crop.		
Wheat after corn and wheat	No crop.		

Wainwright.—Operator, G. C. Boyd. The farm at this point on which the illustration fields are located is owned and operated by Mr. G. C. Boyd, and is situated on the NW. ¼ sec. 8, tp. 45, rge. 6 W of 4 M., 1 mile north of the town of Wainwright. The soil is a chocolate loam, typical of a large area. This land had been cropped previous to 1917 and was summer-fallowed during the season of 1917, to be cropped as directed in 1918.

Youngstown.—Operator, G. S. Coad. The farm selected for illustration work is owned and operated by Mr. G. S. Coad and is situated in the SW. ¼ sec. 27, tp. 29, rge. 9, W of 4 M., 1 mile south of Youngstown. One of the leading roads adjoins this location. The soil is chocolate loam with many burn-out holes, typical of a large area.

This station is to be cropped in the regular rotations in 1919. It was summer-fallowed this season at a cost of $7.71 per acre.

ILLUSTRATION STATIONS IN QUEBEC.

Aubrey, Chateauguay County.—Operator, Samuel Reddick. Four-year rotation.

Field A—Banner oats. Yielded 53 bushels 13 pounds per acre; actual cost being 20¾ cents per bushel, and standard cost 20½ cents per bushel; straw valued at $6 per ton.

Field B—Clover. First crop yielded 2 tons 300 pounds per acre; actual cost being $6.75 per ton, standard cost $6.25 per ton.

Field C—Corn. Estimated yield 10 tons per acre; actual cost $3.09 per ton, standard cost $3.04 per ton.

Field D—Clover hay. First crop yielded 1 ton 1,320 pounds per acre; actual cost being $8.60 per ton and standard cost $8 per ton. Second crop from the same field yielded 4 tons of fodder. This crop was threshed and yielded 40 lbs. seed per acre, actual cost being $34.50 and standard cost $31.75. Part of field D in Timothy yielded 1,756 pounds of fodder per acre, which was threshed, yielding 231 pounds of seed, actual cost being 2¼ cents per pound, standard cost 2½ cents. Actual cost of manual labour was 20 cents per hour and for horse labour 7½ cents per hour.

Laehute, Argenteuil County.—Operator, S. E. Smith. Four-year rotation.

Field A—Banner oats. Yielded 42 bushels 28 pounds per acre; actual cost being 27¾ cents per bushel and standard cost 25¼ cents per bushel.

Field B—Corn. Estimated yield 8 tons 1,600 pounds per acre; actual cost being $2.99 per ton, standard cost $2.61 per ton.

Field C—Clover hay. First cut yielded 1 ton 400 pounds per acre. Second cutting yielded 5 tons. The second cut was threshed and gave a yield of 67 pounds of seed per acre, at an actual cost of $79.60.

Field D—Clover hay. First cutting yielded an average of 1 ton per acre. The second cutting of the same year yielded 5 tons fodder and the second cutting was threshed and gave a yield of 67 pounds of seed per acre. The total actual cost per acre $16.36. Cost of manual labour was 21½ cents per hour and cost of horse labour 10 cents per hour.

New Carlisle, Bonaventure County.—Operator, E. M. Lagallais. Four-year rotation.

Field A—Banner oats. Yielded 53 bushels per acre at an actual cost of 21¾ cents per bushel and a standard cost of 24½ cents per bushel.

Field B—Potatoes. Yielded 211 bushels per acre at an actual cost of 17¾ cents per bushel and a standard cost of 19½ cents per bushel.

Fields C and D—Hay. Yielded 1 ton 1,000 pounds per acre at an actual cost of $7.95 per ton and a standard cost of $8.26 per ton.

The actual cost of manual labour was 16½ cents per hour, and of horse labour 5 cents per hour.

Stanbridge East.—Operator, C. S. Moore. Four-year rotation.

Field A—Swedes. Yielded 20 tons 1,000 pounds per acre at an actual cost per ton of $3.09 and a standard cost of $2.83.

Field B—Hay, mixed. Yielded 1 ton 1,200 pounds per acre, at an actual cost of $7.50 per ton and a standard cost of $7.35 per ton.

Field C—Clover hay. Two crops yielded 2 tons 1,400 pounds; actual cost being $5.29 per ton and standard cost $5.09 per ton.

Field D—Banner oats. Yielded 55 bushels 20 pounds per acre; straw estimated at 1,300 pounds per acre; actual cost being 36¾ cents per bushel and standard cost 33¼ cents per bushel.

Four-year rotation being started on adjoining undrained land.

Fields E, F, G—Sown to Banner oats. Yielded 21 bushels 11 pounds per acre: straw estimated at 1,300 pounds per acre; actual cost being 74¾ cents per bushel, and standard cost 65 cents per bushel.

Field H—Corn. Estimated 10 tons per acre; actual cost being $3.81 per ton, standard cost $3.18 per ton.

Actual cost of manual labour was 18 cents per hour, and of horse labour 15 cents per hour.

Drummondville, Drummond County.—Operator: Emile Marier. Four-year rotation.

Field A—Corn sown on this field was a failure, owing to continuous wet weather. Land had to be re-sown with oats for green feed.

Field B—Banner oats. Yielded 56 bushels 9 pounds per acre, at an actual cost of 16 cents per bushel and a standard cost of 17¾ cents per bushel: straw valued at $6 per ton.

Field C—Timothy and clover. First cutting estimated at 1 ton 900 pounds per acre. The second cutting of the same season estimated at 363 pounds per acre, from which was threshed 25 pounds of seed per acre. Total actual cost per acre of this field was $10.06; the standard cost was $10.33 per acre. The actual cost of the seed was 8½ cents per pound and the standard cost 10 cents per pound.

Field D—Clover hay. First cutting yielded 1 ton per acre. The second cutting yielded 1,000 pounds per acre, which was threshed, giving a yield of 76 pounds of seed per acre. The actual cost of both crops was $12.15 per acre, the standard cost $12.51 per acre.

Lac à la Tortue, Champlain County.—Operator, S. T. Lupien. Four-year rotation.

Field A—Clover hay. Yielded 1,950 pounds per acre, at an actual cost of $12.44 per ton and a standard cost of $11.82 per ton. The second crop was left on the field as a fertilizer.

Field B—Corn. Estimated yield 10 tons per acre at an actual cost of $2.63 per ton and a standard cost of $2.12 per ton.

Field C—Spring rye. Yielded 15 bushels per acre: straw yielded 1,500 pounds per acre; actual cost being 96 cents per bushel and standard cost 79 cents per bushel.

Field D—Mixer hay. Yielded 600 pounds per acre. The soil on this field is exceptionally poor, not having been manured for many years. Corn is to be sown on this field in 1919 and it is to be manured.

The soil at this station is very light sand, depleted of plant food. However, good progress is being made. It will be noted that field A yielded 1,950 pounds of hay per acre and field D only 600 pounds per acre. It is expected that when the rotation has been twice repeated heavy crops will be harvested.

Rimouski, Rimouski County.—Operator, Nazaire Begin. Three-year rotation:—

Field A.—Banner oats. Yielded 58 bushels, 8 pounds per acre, actual cost being 26 cents per bushel and standard cost 20 cents per bushel.

Field B.—Clover hay. Estimated yield, 1 ton, 750 pounds per acre, actual cost being $10 per ton, standard cost $9.50 per ton.

Field C.—Potatoes. Yielded 314 bushels per acre, actual cost being 21¼ cents per bushel and standard cost 17 cents per bushel.

Four-year rotation:—

Field A.—Clover hay. Estimated yield, 1,875 pounds, actual cost being $12.21 per ton and standard cost $11.27 per ton.

Field B.—Banner oats. Yielded 62 bushels 3 pounds per acre, actual cost being 35 cents per bushel and standard cost 25½ cents per bushel.

Field C.—Corn and roots. Not reported, almost a failure, on account of wet land, which should be tile-drained.

Field D.—Clover hay. Estimated yield, 1,875 pounds per acre, actual cost being $12.43 per ton and standard cost $11.27 per ton. Both clover fields were cut early. No record is given of the second crop.

Actual cost of manual labour was 31½ cents per hour, and of horse labour 10½ cents per hour.

Ste. Julie, Verchères County.—Operator, Adophe Hebert. Four-year rotation:—

Field A.—Corn. Estimated yield, 10 tons per acre, at an actual cost per ton of $1.75 and a standard cost of $1.93 per ton.

Field B.—Timothy grown for seed yielded 120 pounds per acre, and 1,600 pounds of fodder, at an actual cost of 3¾ cents per pound and a standard cost of 4 cents per pound.

Field C.—Banner oats. Yielded 65 bushels 20 pounds per acre, at an actual cost of 23¾ cents per bushel and a standard cost of 26½ cents per bushel, straw valued at $8 per ton.

Field D.—Clover. First crop yielded 1 ton 1,000 pounds per acre at an actual cost of $9.61 per ton, and a standard cost of $10.49 per ton.

Field D.—Clover. Second crop saved for seed. Yield 68 pounds per acre for seed; fodder, 700 pounds per acre, at an actual cost of $14.99 per acre and a standard cost of $14.11 per acre. The actual cost of manual labour was 15 cents per hour, and the cost of horse labour 7½ cents per hour.

St. Gedeon, Chicoutimi County.—Operator, Wilfred Simard. Three-year rotation:

Field A.—Clover hay. Yielded 2 tons 500 pounds per acre, at an actual cost per ton of $6.76 and a standard cost of $6.70.

Field B.—Marquis wheat. Yielded 26 bushels 18 pounds per acre, at an actual cost of 62 cents per bushel and a standard cost of 62 cents per bushel.

Field C.—Potatoes. Yielded 234 bushels per acre, at an actual cost of 21½ cents per bushel and a standard cost of 19½ cents per bushel.

Four-year rotation:—

Field A.—Clover hay yielded 2 tons 500 pounds per acre, at an actual cost of $5.75 and a standard cost of $5.68 per ton.

Field B.—Swedes and mangels. Yielded 20 tons per acre, at an actual cost of $1.95 per ton and a standard cost of $1.87 per ton.

Field C.—Hay. Estimated yield, 1 ton 500 pounds per acre, at an actual cost of $9.14 per ton and a standard cost of $9.08 per ton.

Field D.—Banner oats. Yielded 61 bushels 15 pounds per acre, at an actual cost of 14¾ cents per bushel and a standard cost of 14¾ cents per bushel.

The actual cost of manual labour was 23 cents per hour, and for horse labour 4 cents per hour.

DIVISION OF EXTENSION AND PUBLICITY.

REPORT OF THE OFFICER IN CHARGE, W. A. LANG.

The work of the division during the past year may briefly be stated to have been attending fairs, exhibitions, etc., issuing and distributing exhibition circulars and enlarging the mailing list.

It was found more and more difficult, as the war progressed, to find the men to carry on exhibition work and in the case of five of our branch Farms no work of this

nature could be undertaken, for unless competent and well-qualified attendants are available for this work it is better left undone; while in nearly all cases the remaining branch Farms were compelled to curtail the work. Last year, 117 fairs were attended by the branch Farms, while this season only 39 were reached, and 29 fairs were attended from the Central Farm as against 56 this season, 146 as against 95. When conditions become normal and the men are all returned from overseas, there is no reason to doubt that the branch Farms will be able to secure the necessary assistants to cover at least 10 exhibitions each making an aggregate of 200 fairs.

It was decided to follow the plan adopted last year of covering the provincial fairs on the Prairie circuit with a general exhibit from the Central Farm and this exhibit was supplemented by exhibits from the branch Farm of the district in which the exhibition was held.

Many thousands of our exhibition circulars have been distributed during the year, both at the exhibitions and from the office. 15,580 names have been added to the mailing List, of which 11,670 were English and 3,910 French.

Judging by the number of requests we get for the Experimental Farm exhibit and from the very favourable reception given when an exhibit is sent, we feel that it is fair to draw the conclusion that the Farms' exhibition work is appreciated, not only by the fair officials but by the farmers as well.

Owing to the great number of exhibitions held in the Dominion in a comparatively short season, it must happen that dates will clash, that many fairs will be going on on the same date, for instance this year 19 fairs were held in the province of Ontario on the same dates. It therefore follows that in order to reach all the exhibitions (and we feel that the small fair has the same call on the department as the large one) more exhibits must be sent out each year, not only from the Central Farm, but also from some of the branch Farms.

EXPERIMENTAL STATION, CHARLOTTETOWN, P.E.I.

REPORT OF THE SUPERINTENDENT, J. A. CLARK, B.S.A.

THE SEASON.

An early spring followed a long, cold winter. The snow disappeared from the fields early in April. A continuous covering of snow had remained on the fields throughout the winter, which not only admirably protected the hay fields, but prevented a deep penetration of frost. Bright, warm days with drying winds during April dried up the fields rapidly and enabled farmers to work up and seed considerable areas of the drier land toward the close of the month. Ideal weather conditions throughout May enabled the farmers to put in their crops rapidly and well. Practically all grain, potatoes and a large percentage of the root crops were planted during the month.

Taken generally, the season of 1918 was not entirely satisfactory for the maximum yields of all classes of farm crops. The yields of all classes of fruit were very light; the very severe winter weather left the fruit buds in a weakened condition, which, when called upon to resist the frosts that occurred on the 20th and 21st of June, were unable to do so, and consequently dropped shortly afterward. Severe frosts in June and again in September caused considerable losses in tender crops such as tomatoes, corn and beans. Continued cold weather, with but little precipitation during the months of May and June resulted in what gave promise of a maximum hay crop yielding slightly below an average crop. Frequent showers during July and early August greatly retarded haymaking, and also injured the quality of some of the heavier cuts. These showers that were detrimental to the hay crop, were admirably

suited to the grain crops, which yielded abnormally throughout the province. In spite of continuous inclement weather during harvest, the majority of the grain and fodder crops were saved in good condition. Potatoes suffered severely from Late Blight in unsprayed districts, which, combined with the wet, humid weather, resulted in serious losses from rot. The frosts in June and September, in conjunction with cool weather throughout the summer, were responsible for the poorest crops of corn, tomatoes, beans, as well as many garden crops, that have been grown for years. Roots yielded below the average, but were of good quality, and exceedingly free from disease. Mild, open weather during the greater part of November, enabled the farmers to complete successfully the gathering of their crops, as well as to finish up their fall ploughing. The "freeze up" of the winter came on November 26. Snow sufficient for sleighing fell early in December, and remained on the ground throughout the winter. The winter has been exceptionally mild, without severe storms, and further marked by the absence of heavy thaws.

METEOROLOGICAL RECORDS.

Months.	Temperature Fahrenheit.					Precipitation.					Bright Sunshine. Hours.
	Maximum.		Minimum.		Mean.	Rainfall.		Snowfall.		Total.	
	Date.	Degree	Date.	Degree	Degree	Days.	Inches.	Days.	Inches.	Inches.	
April...	29	62	8	12	35·499	6	·86	2	3	·89	183
May.....	19	79	5	28	50·37	8	1·84			1·84	254·2
June....	3	79	20	37	56·816	8	3·25			3·25	245·7
July.....	23–27–30	83	9 & 25	46	65·032	13	4·53			4·53	181·9
August...	24	82	19	42	62·161	9	1·37			1·37	254·1
September	6 & 15	78	12	32	58·74	15	5·60			5·60	153·1
October...	13	65	20	28	47·61	17	5·51			5·51	108·1
November	1	63	26	13	35·93	12	2·87	4	6·5	3·52	62·6
December.	15	47	8	5	25·016	3	2·11	13	31·5	5·26	49·7
1919.											
January.....	2	44	12	−13	21·177	6	1·65	8	14·5	3·10	70·9
February....	16–19–24	35	10–23–28	5	22·856	1	·15	13	23·25	2·475	99·1
March.....	10 & 28	43	14	4	27·61	11	3·15	1	1	3·25	129·2
Totals for year.						109	32·89	41	79·75	40·595	1,771·6

LIVE STOCK.

Horses.

The draft horses at this station consisted, at the close of the year, of two pure-bred Clydesdales mares, one grade mare, one grade gelding, one grade gelding rising three years old, and one pure-bred filly rising two years old. In addition to these, there are one express horse and one driving mare. The loss of one horse from an unknown cause, and another from colic during the year, necessitated the hiring of extra horses during the busy seasons.

Dairy Cattle.

The pure-bred Ayrshire heifer, "Lily Helen" No. 53710, dropped a bull calf on June 29. This heifer has produced 4,370·7 pounds of milk up to March 31, and gives promise of being a high producing animal. A yearling pure-bred Ayrshire bull "Duke of Ravenwood" as well as the bull calf mentioned above, were sold during the year. A seven-eighths Ayrshire grade cow was purchased to augment the supply of milk at this station at the beginning of the winter. "Ottawa Ivanhoe", a very promising young Ayrshire bull of excellent breeding was received, late in March, from the Central Experimental Farm, Ottawa, for breeding purposes in this province.

Beef Cattle.

Twenty-eight grade steers, ranging from two and one-half to three years old, and mostly of a good thrifty, typical Shorthorn appearance, were purchased from local drovers during the latter part of October. They were dehorned and allowed to run on pasture, supplemented by corn stover, turnip and mangel tops, until November 13, when they were brought in, weighed and divided into seven pens of four steers each.

The special feature of our work with fattening steers, from November 15, 1918, to March 15, 1919, was the conducting of feeding tests that would be practicable to the general farming community of Prince Edward Island, and thereby secure reliable information which would be of service to farmers who wished to undertake work of this nature. For this reason greater stress was put upon home-grown grains, fed separately, mixed and in combination with commercial feeding concentrates. In addition to these experiments, tests were conducted whereby the feeding value of dried blood meal, which is manufactured at one of our local abattoirs, could be ascertained. The results obtained, although not conclusive, would tend to show that a mixture of ground oats and barley, equal parts by weight, is cheaper, is as profitable and as satisfactory as feeding them separately in combination with the commercial feeding concentrates, such as oil cake meal, cotton seed meal, 36 per cent protein, or shorts. From the three tests conducted during the past winter with dried blood meal, the results obtained indicate that it is not a profitable feed for fattening steers. The following gives a statement of the expenditure:

Purchase price of 28 steers, 23,255 pounds at 8¾ cents	$2,034 81
Total cost of feed from November 15 to March 15, 1919	970 48
Total expenditure	$3,005 29
Selling price, 30,025 pounds at 14·87 cents per pound	4,467 23
Profit	$1,394 86
Average weight per steer after a 16-hour fast	1,072 pounds.
" " " when purchased	830·5 "
Gain per steer	241·5 "

Swine.

Six sows were purchased early in April. They consisted of one mature pure-bred Yorkshire sow and five young sows. The pure-bred sow gaves a litter of eight pigs on May 28. The five young sows were bred, and three of them gave litters of eleven, nine and six pigs respectively, in August. The remaining sows proved undesirable, and were fattened and slaughtered. Four brood sows were bred in December and early January, and carried through the winter. These sows were housed during the winter in a portable hog cabin 8 feet by 10 feet, the frame of which was boarded in with one thickness of inch boards, and which was constructed for $33.76; a yard was also provided for exercise.

The sows came through the winter in remarkably fine shape, being in that healthy and vigorous condition which is so essential in the breeding sow.

POULTRY.

The poultry plant was enlarged during the year by the erection of one permanent poultry house, 32 feet by 16 feet, divided into two equal pens by a wire mesh partition, each pen of which provides accommodation for fifty hens; and one 10 feet by 12 feet portable brooder house.

Two successful hatches were taken from our incubators in May and June, giving us 2,421 properly developed chickens. Eight hundred and eighty-five of these were

sold as day-old chicks, 639 were reared to maturity at this station, and 869 succumbed to exposure, lack of brooder capacity, foxes, hawks, etc., throughout the summer. Out of the 639 chickens reared, 403 were sold for table use, 206 were selected from the entire flock for our winter laying pullets and breeding males, while the remaining 30 were sold for breeding purposes.

After the 1918 breeding season, the flock of some two hundred birds was carefully graded; all birds with a small egg production were classed with the undesirables and disposed of. The number of birds selected from the above flock to be carried over as breeding stock for 1919 consisted of 90 Single Combed White Leghorns and 33 Barred Rocks. The poultry wintered for egg production and for breeding purposes consisted of the following:—

	Pullets.	Hens.	Males.
Single Combed White Leghorns	105	90	7
Barred Plymouth Rocks	91	32	6

As a means of stimulating an interest in better breeding and productiveness of poultry throughout Eastern Canada, and whereas Prince Edward Island was the most progressive Maritime Province in the poultry business, it was selected as the place to conduct the first "Egg Laying Contest" of the Dominion. This further augmented our poultry plant by the addition of ten 12 feet by 10 feet houses and 160 birds. Each house was divided into two equal pens by a wire mesh partition, and provided accommodation for two entries of eight birds each. Each pen was given an outdoor run 12 feet by 25 feet in area. The number of contestants from the different provinces was as follows: Prince Edward Island, 7; Nova Scotia, 5; Quebec, 1; New Brunswick, 3; Ontario, 1.

BEES.

The colony of Italian bees that was carried over the winter of 1917-18 dwindled and died early in the spring. A few pounds of Italian bees were sent from Ottawa, which increased rapidly and swarmed on August 13. Two fairly strong colonies were fed and put in wintering cases out-of-doors in November.

FIELD CROPS.

Averaging the different yields of the same crop on the various rotations conducted at this station, we find the average yield per acre to be as follows:—

Barley, one acre field of Charlottetown No. 80 yielded 52 bushels, 29 pounds.
Clover hay, six fields of clover hay averaged 2 tons, 1,495 pounds.
Timothy hay, five fields of timothy averaged 3 tons, 315 pounds.
Mangels, three fields of mangels averaged 678 bushels per acre.
Potatoes, two fields of potatoes averaged 299 bushels per acre.
Oats, three fields of oats averaged 73 bushels 15 pounds.
Wheat, four fields of wheat averaged 34 bushels 16 pounds.
Turnips, nine plots of turnips averaged 820 bushels per acre.

ROOT SEED PRODUCTION.

The mangel and turnip stecklings that were grown and carried over the winter of 1917-18 for root seed production, were planted out early in May. Soon after planting, it was noticed that the vitality of the greater percentage of these was so low that they failed to start growing. From the ones that reached maturity, there were produced 1,483 pounds of mangel and 278 pounds of turnip seed.

Twenty acres were devoted to the raising of stecklings for root seed production in 1919. Equal areas of this acreage were planted late in June to turnips and mangels. The season was well suited to these crops, and they developed rapidly, and

gave an excellent yield. They were harvested in good condition, in spite of the unfavourable weather, and stored partly in pits and partly in temporary cellars. Care was taken in the storage of these roots to have them dry and as free from earth as possible, which enabled us to keep the temperature during storage very uniform, ranging between 32° and 38° F. throughout the winter.

CEREALS.

Forty-one different varieties of wheat, oats and barley were tested in duplicate plots of one-sixtieth acre each, on an area that has been set aside for this purpose, and which is worked under a definite four-year rotation. This test included fourteen varieties of wheat, thirteen varieties of oats and fourteen varieties of barley. Whiteheads proved to be the most productive variety of wheat, yielding 65¼ bushels per acre: Early Blossom was the most prolific variety of oats tested, yielding 103¾ bushels per acre; and O.A.C. No. 21 led in the test of barleys, with a yield of 71½ bushels per acre. All of these grains were remarkably free from attacks of fungous diseases. The peas in the variety test of field peas were so badly damaged by the pea moth that no records were taken.

FORAGE CROPS.

Variety tests were conducted with a limited number of best commercial varieties of field roots. This work included a test of the following: five varieties of Swede turnips, led by Cornings Laplander, with a yield of 966¾ bushels per acre; three varieties of mangels, led by Half Sugar White, with a yield of 612½ bushels per acre: six varieties of sugar beets, led by Russian, which yielded 570¼ bushels per acre; and three varieties of field carrots, led by White Belgian, which yielded at the rate of 335¼ bushels per acre. Four varieties of ensilage corn that was ripened at this station in 1917, were further tested in 1918; but severe frosts in late June and early September, in conjunction with unfavourable corn weather throughout the summer, resulted in the poorest crop of corn harvested in many years. Quebec Yellow reached the highest stage of maturity before being killed by frost.

An area of 1½ acres, which was devoted to the testing of various grasses and combinations of these for hay and pasture in 1917, gave good acreage yields; an equal area was seeded down to alfalfa in 1917, and only a fair catch of alfalfa was secured, resulting in a light crop in 1918.

HORTICULTURE.

Tree Fruits.

The orchards, wherein most of the leading commercial, as well as many of the newer, varieties of apples, cherries, pears and plums are being tested for hardiness and fruitfulness, yielded no fruit this season. The cherries blossomed and set a fair crop of fruit, which was destroyed by birds before it was ready for harvest. Apples, pears and plums blossomed sparingly, but set no fruit, which may be attributed to the fruit buds being in a weakened condition, due to the severe winter followed by heavy frosts late in June. Out of 111 varieties of apples, 43 varieties of plums and 22 varieties of pears, 13, 14 and 4 varieties respectively proved unsuited to our weather conditions during the year. The orchard was sprayed and kept free from attacks of insects and fungous diseases.

Small Fruits.

The work at this Station in connection with small fruits has been devoted entirely to a test of varieties. This test includes the following numbers of varieties of each class of fruit, namely: 30 of strawberries, 15 of red currants, 14 of black currants,

5 of white currants, 8 of gooseberries and 7 of raspberries. The majority of these varieties seem well adapted to this climate. The yields from all classes of these fruits were very small.

Trees, Shrubs, Flowers and Lawns.

The ornamental trees and shrubs upon the lawns and along the driveways have developed well and give a very pleasing landscape effect. The former suffered severely from a heavy sleet storm followed by a high wind in January, which broke some of them badly. The majority of the latter have proved hardy. The flowers were very attractive; the weather conditions were particularly suited to their best development. The sweet peas were exceptionally good, while the dahlias and other flowers were above the average. The lawns were not so attractive as usual, owing to a large portion of the east lawn being planted to beans, buckwheat and clover, while a portion of the south lawn was planted to rape.

Vegetables.

Much of the experimental work with vegetables, including many of the variety tests, as well as much of the cultural work, was discontinued during the year, and the garden land utilized in vegetable and root seed production. Successful crops of spinach, radish and cabbage seed were produced. The tomatoes, beans, onions, squash and pumpkins were below the average, owing to the early frost and unfavourable weather conditions.

BUILDINGS.

The buildings erected at this Station during the year consisted of one permanent poultry house 32 feet by 16 feet, ten portable colony houses, (for Egg Laying Contest), 12 feet by 10 feet, one portable brooder house 10 feet by 12 feet, one portable hog cabin 10 feet by 8 feet, and two temporary root cellars, which were constructed for the storing of our steckling crop. In addition to these, the sheep barn was remodelled slightly, for experimental work with steers, while minor repairs were made on the other farm buildings.

EXHIBITIONS.

The only exhibition conducted in the province in 1919 was held at Charlottetown late in September. At this fair the Station erected a very pleasing and attractive exhibit of farm produce, as well as an interesting collection of models relating to farm buildings and practical devices. The display was augmented by exhibits put up by the Division of Extension and Publicity, Ottawa, and by the Plant Pathological Laboratory at Charlottetown. These combined exhibits were the feature of the fair. The attendance at this exhibition was comparatively small, due to bad weather, but the interest shown in all features of work carried on by the Station was good.

PICNICS, DEMONSTRATIONS AND AGRICULTURAL MEETINGS.

Several farmers' picnics were held in the picnic grove on the Station during the summer. These were largely attended, and much interest was shown in all phases of the work. Demonstrations with the Eureka Potato Digger and Cleveland Tractor were given during the early autumn. Demonstrations and lectures on the care of live stock and poultry were arranged and given to the students of the Prince of Wales College in December. The Officer in Charge attended the annual meeting of the Farmers' Institute, the annual meeting of the Co-operative Egg and Poultry Association, and the annual meeting of the Nova Scotia Fruit Growers' Association, and addressed meetings when requested. The Experimental Station was visited, during the early part of December, by the Governor General of Canada, and staff. They inspected the farm operations, and manifested a keen interest in the work that is being carried on.

EXPERIMENTAL STATION, KENTVILLE, N.S.

REPORT OF THE SUPERINTENDENT, W. SAXBY BLAIR.

THE SEASON.

The first half of April, 1918, was below normal in temperature, but because of being bright and the weather dry, it had every appearance of being more forward than usual. The latter half of the month was about normal in temperature, and because of little rain, together with bright days and drying winds, land was fit to work by the 24th of the month.

May came in warm with a mean temperature considerably above normal, in fact the mean for the month was 10 degrees above that of the previous season. May, like April, was unusually bright, the sunshine during the two months being over twice that of 1917. The rainfall during May was very light, in fact, except for two days, it was possible to continue work on the land uninterrupted during the whole month. This weather not only favoured the putting in of crops but brought along all fruit trees rapidly and the season of the blossoming of fruit trees two weeks ahead of the previous year and much earlier than normal. Amelanchier in bloom in 1917 on the 2nd June were in bloom this year on the 13th May. Gravenstein apples, which were in bloom in 1917 on the 7th June, were this year in bloom on the 18th May. The land was very dry toward the end of May and even wet lands could be worked, in fact such lands were drier than they had been at any time during 1917.

As a result of the continued dry weather during May, grasses did not make their usual growth and rain was much needed for this crop. June continued warm, the mean temperature for the first half, however, was higher than for the second half. There was a white frost noted on the 21st at this Station, and the temperature in many parts of the Valley fell to the freezing point on the 20th and 21st, doing very great damage to early planted potatoes and other tender crops. These frosts were more or less general all over Nova Scotia and many garden crops were injured.

There were light showers during early June and a rain of ·92 inches on the 13th, which was much needed as the ground was very dry at this time. The month like April and May was unusually bright and the amount of sunshine recorded was much greater than for the three previous seasons. The weather on the whole was unfavourable for apple scab development and orchards were up to this time practically free from this disease.

There was a good rain of 1·15 inches on the 3rd of July, which was much needed. This rain fell rapidly and was not all soaked up by the soil. The temperature was normal and the amount of sunshine was very similar to previous years. Some scab developed from the 3rd to the 8th, the weather being damp and favourable. This was also the week when strawberries were being picked and much soft fruit resulted. August was dry and from the 9th to the 25th no rain fell. Lawns were showing the effect of this dry spell very materially and in some cases potatoes were wilting considerably on dry areas. Otherwise the month was normal. September was a wet month, rain falling on 14 days aggregating 8·06 inches. This thoroughly soaked the ground and made fall harvesting exceedingly difficult. There was a frost on the 12th in many parts of the Valley, doing much damage to corn and other tender crops. There was, however, no frost at this Station.

The mean temperature, rainfall and sunshine for the six summer months for this year as compared with the five previous years, are given in the following table:—

Mean Temperature.

Month.	Mean Temperature.					
	1913.	1914.	1915.	1916.	1917.	1918.
	°	°	°	°	°	°
April	41·9	36·8	39·36	39·81	38·4	38·74
May	46·2	50·72	46·14	49·07	43·63	53·97
June	56·7	56·2	56·8	58·3	60·36	57·58
July	65·4	62·88	64·0	66·045	65·93	65·43
August	63·3	63·0	63·8	64·9	67·67	61·80
September	54·3	57·6	57·25	58·93	53·94	58·56

Rainfall.

Month	Rainfall.					
	1913.	1914.	1915.	1916.	1917.	1918.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.
April	4·29	2·33	1·70	2·34	4·09	·80
May	3·17	1·46	2·50	1·78	2·92	1·21
June	1·23	4·20	2·43	3·69	2·93	2·30
July	3·72	1·45	1·52	2·66	3·65	4·99
August	1·70	2·58	3·84	·86	5·15	1·72
September	2·55	3·65	·85	1·74	3·72	8·06
Total	16·66	15·67	12·84	13·07	22·46	19·17

Sunshine.

Month.	Sunshine.					
	1913.	1914.	1915.	1916.	1917.	1918.
	Hours.	Hours.	Hours	Hours.	Hours.	Hours.
April	137·1	196·0	107·4	139·9	107·6	203·7
May	178·2	189·6	160·9	186·8	101·7	224·6
June	270·1	250·3	180·2	160·5	176·3	214·9
July	252·1	238·9	215·7	205·7	195·6	197·8
August	238·4	211·1	168·3	221·2	202·1	234·2
September	156·6	173·8	194·0	174·6	214·7	165·8
Total	1,232·5	1,259·7	1,026·5	1,088·7	998·0	1,241·0

October was wet during the early part of the month, but a dry spell from the 7th to the 13th gave an opportunity to get out potatoes on lands previously too wet to dig. There was a frost of 3 degrees on the 9th which killed corn and injured pumpkins and squash and similar tender crops not harvested. The latter part of the month was warm and as a result was suitable for the gathering of apples that had not earlier been stored. Turnip stecklings pulled and stored for seed because of the damp warm weather started growth considerably in storage and there apparently was no way of checking this. This fortunately was checked by the cooler weather early in November. There was a light fall of snow on the 18th and a light frost on the 17th, 18th and 19th.

November was fine and open until the 13th when 10 inches of snow fell. This remained on the ground until the 18th and 19th when 2·05 inches of rain fell and this,

together with the melting snow, caused very heavy freshets, which, together with unusually high tides which broke the dykes in places, flooded low areas throughout the country. The snowfall on the 10th did very much damage from the snow being wet and no wind, clinging to trees and wires, breaking many telephone and telegraph wires, and damaging many orchard trees from the heavy weight of snow which collected on them. The last ploughing possible was on the 23rd of the month.

December was moderate throughout, the temperature going below 20 degrees on seven nights only, the lowest being 3 degrees on the 8th. The mean temperature was 27·32 degrees as compared with 19·66 degrees in the previous year for this month. The snowfall was 19 inches, of which 8 inches fell on the 29th making good sleighing until the 2nd of January. Other than this, there was no sleighing in December.

During January the temperature went below zero on two days only, on the 12th, 7 degrees below, and on the 21st, 2 degrees below. The mean temperature was 24·20 degrees as compared with 18·16 degrees in 1918. Rain fell on 8 days and snow on 7 days, the latter amounting to 15 inches, of which 6 inches fell on the 10th and 11th. This snowfall was followed by wind and cold weather which resulted in the only storm of the month of any consequence. The snowfall was light and because of the mild weather or wind, did not make sleighing. The only sleighing during the month was during the first two days.

February was mild throughout, the mean temperature being 27·31 degrees as compared with 18·88 degrees for the same month for the five previous years. The temperature went below 17 degrees on 6 days only, the lowest being 9 degrees. The snowfall was light, amounting to 5½ inches only, which went off soon after it fell. There was sleighing on the 26th and 27th only during the month. The sunshine was about normal.

March, like February, was mild throughout. The temperature went below 20 degrees on 8 days only. The coldest period was on the 14th when the temperature went to 8 degrees. The average of the mean temperature for the five previous years was 26·51 degrees, as compared with 33·32 degrees for 1918. There was no snow during the month, which is very unusual. Rain fell on 12 days, the total being 2·38 inches, with the heaviest, 0·69 inches, on the 10th. March closed with very little frost in the ground and the fields generally were free from excessive surface water.

METEOROLOGICAL RECORDS, 1918-1919.

Months.	Temperature.				Precipitation.					Hours Bright Sunshine.
	Maximum.		Minimum.		Rainfall.		Snowfall.		Total.	
1918.	Date.	°	Date.	°	Days.	Inches.	Days.	Inches.	Inches in rainfall.	
April.	28	66	8	16	4	0·83	3	6	0·89	203·7
May.	18	88	5	26	6	1·21			1·21	224·6
June.	2	83	21	34	9	2·30			2·30	214·9
July.	27	88	25	45	14	4·99			4·99	197·8
August.	24	90	19	37	6	1·72			1·72	234·2
September.	5	81	12	34	14	8·06			8·06	165·8
October.	29	74	24	28	15	4·36			4·36	115·5
November.	1	58	26	15	9	3·14	1	10	4·14	80·5
December	15	57	8	3	2	1·35	7	19	3·25	56·2
1919.										
January.	2	53	12	− 7	8	3·23	7	15	4·73	53·5
February.	21	40	10	9	3	0·99	5	9½	1·94	95·0
March.	20	48	14	8	12	2·38			2·38	130·1
Total.						34·56		59½	39·97	1,771·8

LIVE STOCK.

Horses.

Eleven draught horses and one driving horse are kept at this station. No feeding experiments were conducted with horses during the year, and the aim has been to keep them in good working condition with the least possible feed.

Cattle.

The registered Shorthorn herd is made up of 15 cows, ranging from 2 to 12 years in age; 13 heifers over 1 year, 5 under 1 year; 6 bulls under 1 year; the herd bull, Jilt's Denis, and a young bull, May Don of Fredericton, 22 months old, to replace the herd bull a little later on, making a total of 41 head of registered stock. Six registered bulls ranging from 4 to 8 months old were sold for breeding purposes during the year. The only grade stock carried consists of 2 cows and 2 calves from these cows. These are grade Shorthorns.

Eleven of the cows completed their lactation periods during the year, and of these 8 are in the Record of Performance test. Six cows are in the mature class, 1 is four years, 2 are three years, and 2 are two years with first calf. The average days milking for the registered Shorthorn cows was 272 days, the dry period 133 days, the milk yield 4,370·9 pounds, per day 16·08 pounds, per cent fat 4·05, pounds of butter 205·03, value of butter $95.18, value of skim-milk $12.59, cost of feed from one milking period to the next one $86.64, profit per cow $21.13. Kentville Blossom made a loss of $18.54. Louisa May 2nd $7.60, and Kentville Countess $2.06. The others ranged in profit from $6.95 to $70.44, the latter being the profit from Hedgyn Susan, who produced 7,072 pounds of milk, an average of 23·41 pounds per day while milking. No stock was lost from sickness or otherwise during the year.

Steers.

Twenty-four steers were carried during the winter. The object of the test was to determine the relative profits from feeding light and heavy steers. One lot of twelve steers averaged about 800 pounds and the other lot averaged 200 pounds heavier. The steers ran loose in a box stall 25 by 14 feet, the twelve together. They were fed alike, each receiving the same amount of feed. The summary of results was as stated below. The steers were put in during early October and dehorned. The test started October 14 and continued for 168 days. They cost 9¼ cents per pound and were sold at 13 cents per pound:—

	No. 1. Largest Steers	Lot 2. Smallest Steers.
First weight average..lb.	1,006·6	785·4
Finished weight average "	1,190·8	1,017·68
Average gain per steer "	184·1	231·6
Daily gain per steer "	1 095	1 378
Average sale price per steer at finish..$	154 808	132 22
" valuation per steer at start.. "	93·116	72·65
" increase in value.. "	61·692	59·57
" cost of feed per steer.. "	57·16	57·16
Profit per steer.. "	4·53	2·41

Swine.

Five registered Yorkshire sows and one registered Yorkshire boar were obtained from the Central Farm in the fall. These have made excellent growth and some good stock should be had from these in the early spring.

POULTRY.

The poultry equipment consists of two permanent 100-hen houses, 16 by 32 feet each, seven colony houses 8 by 12 feet each, two brooder houses, one duck house, and a supply house, with an incubator room in the basement.

The stock carried during the winter consisted of 195 pullets, 36 hens and 14 male birds. The breeds carried are Barred Plymouth Rock, White Wyandotte and Rhode Island Red. Forty cockerels were sold for breeding purposes.

The production of eggs and cost of feed during the winter were as follows:

Month.	Eggs.	Price of Eggs.	Value of Eggs.	Cost of Feed.
		Cts.	$ cts.	$ cts.
November	51	50	2 16	46 48
December	402	63	21 11	44 68
January	1,286	63	67 50	58 16
February	2,034	55	93 22	59 77
March	2,945	38	93 26	56 59
			277 25	265 68

The feed consisted of oats at night at the rate of 1 quart to 13 birds, and wheat in the morning at the rate of 1 pint to 13 birds. This was scattered in deep litter. In addition a dry mash of bran and crushed oats of equal parts was before the hens at all times in a hopper. Beef scrap was also in a hopper for them as they wished it. Mangels were supplied in the quantity that they would eat up clean in 2 hours.

BEES.

The bees carried over the winter of 1917-18 came through in good condition. The number of colonies was increased from seven to twelve. The average yield of honey per colony, spring count, was 40·7 pounds. The honey was sold at 23 cents per pound. The average value of production from each colony, allowing $5 for the value of increase per colony was $13.33. The bees were wintered again in cases outside, using planer shavings for packing material.

FIELD HUSBANDRY.

As stated in previous reports no attempt has yet been made to conduct definite rotation experiments. The practice followed, however, in all our field work has been to adopt a three-year rotation of grain following a hoed crop and seeding down to timothy and clover, using 8 pounds red clover, 2 pounds alsike and 8 pounds of timothy seed per acre.

CROP YIELDS.

The season was a favourable one for the growth and maturity of all cereal crops. The harvesting period, however, was wet and the expense of harvesting and drying the grain was greatly increased and quite unsatisfactory. Ten acres of Banner oats at the rear of the farm cleared in 1916 yielded 459 bushels. Five acres on land which was in turnips in 1917 yielded 410 bushels. The total oat yield was 949 bushels, and the other cereal crops from fertilizer areas and cereal plots made a total grain yield of 1,240 bushels. Six and one-half acres of dyked land produced 23 tons 1,260 pounds or 3 tons 1,326 pounds per acre. Ten acres of upland yielded 19 tons, and eight and one-half acres of limed and slag plots yielded 16 tons 1,610 pounds or 1 ton 1,954 pounds per acre. This with other small areas made a total hay crop of 69 tons 500 pounds.

The corn for ensilage was a fair crop. One area of two acres of Southern Dent produced 13 tons 200 pounds per acre. Eight acres in another field yielded 11 tons 1,850 pounds, and three acres in another area yielded 14 tons 300 pounds per acre. The total put into the silo amounted to 164 tons 100 pounds. It was difficult to get Longfellow, the variety usually planted, and the crops were for the most part a mixture of Southern Dent, Canada Yellow and Longfellow.

The root crop was unusually good for the light lands at this Station. Four and one-half acres of turnips yielded 933 bushels per acre. The turnip crop stored for feeding was 4,100 bushels. Two acres of Danish Sludstrup mangels from seed produced at this Station yielded 983 bushels and 45 pounds per acre, and one and seven eighth acres seeded to Mammoth Red Mangels yielded 811 bushels and 33 pounds per acre. The total crop harvested amounted to 2,678 bushels of which 500 bushels of Danish Sludstrup were stored for seed purposes.

LIMESTONE AND FERTILIZER EXPERIMENTS.

Experiments having for their object a determination of the agricultural value of ground raw limestone, were continued this season. These tests were on plots of one-half acre each. Limestone is valuable principally in making possible a good clover growth. The limestone was applied and the slag as well in the spring of 1917 when seeding down. The yield of hay was as follows:—

	Yield per Acre. Pounds.
Slag ½ ton, average of 4 plots	3,996
" ½ " lime 2 tons average of 4 plots	4,617
Lime, 2 tons, average of 4 plots	4,580
Check, average of 2 plots	2,480

The experiments on the five acres devoted to orchard fertilizer tests and the four acres devoted to fertilizer tests conducted by the Division of Chemistry were continued this season. The tests started some years ago with commercial fertilizers on limed and unlimed plots were continued and a summary of the yield of Marquis Wheat on duplicate areas embracing all the tests was as follows:—

	Yield per Acre. Straw.	Grain	
	Lb.	Bush.	Lb.
1918, wheat, limed and fertilized	2,626	30	14
" not limed but fertilized	1,996	23	48
" limed and not fertilized	2,260	29	50
" not limed and not fertilized	1,980	19	30

CEREALS.

Experiments with cereal crops consisted of one acre each of Marquis, Huron and Red Fife spring wheat; Manchurian, Canadian Thorpe and Charlottetown No. 80 Chevalier barley; Victory, Banner O. 49, Daubeney and Liberty Hull-less oats; No. 61 O. A. C. spring rye and the Arthur and Golden Vine pea. A one-quarter-acre of Dawson's Golden Chaff winter wheat was also grown. The spring wheat averaged 24 bushels and 27 pounds per acre; the winter wheat 30 bushels and 20 pounds per acre; the barley 29 bushels and 27 pounds per acre. The three varieties of oats averaged 72 bushels and 21 pounds per acre. The hull-less oat produced 45 bushels and 13 pounds per acre; the spring rye 36 bushels and 23 pounds per acre, and the peas 26 bushels and 40 pounds per acre. The Huron wheat, grown this season for the first time here, is a bearded wheat of good quality and seems more suitable to our conditions than either the Red Fife or Marquis. The yield was 27 bushels and 40 pounds per acre. The Hull-less oat, Liberty, has done remarkably well but seems very liable to smut and should be treated with formalin before seeding. The O. A. C. No. 61 spring rye made a vigorous growth and appears to be a very satisfactory sort.

FORAGE CROPS.

Owing to the impossibility of getting reliable seed of the various root crops usually tested, and because of the shortage in seed of different sorts of corn for ensilage, no tests were carried with these crops during the past season.

The one acre of alfalfa which produced a satisfactory crop in 1917 winter-killed badly and as only about fifteen per cent of the plants started, the area was ploughed and seeded to corn. The forty-eight one-fortieth-acre plots of different grasses and clover mixtures seeded in 1916 gave interesting results. The results would show that 8 pounds of red clover, 2 pounds of alsike and 8 pounds of timothy give the most satisfactory yield of hay. None of the grasses is better than timothy for hay yields. Red clover produces a larger yield per acre than alsike, but a larger yield is obtained from a mixture of 8 pounds of red and 2 pounds of alsike, than to use 10 pounds of red clover or 6 pounds of alsike per acre separately with any of the grasses tested.

ROOT SEED PRODUCTION.

The turnip steckling grown in 1917 were planted in the spring of 1918. Twenty-one acres of Corning Green Top yielded 9,718 pounds of seed, or an average of 462·8 pounds per acre. Twenty-one acres of Canadian Gem yielded 10,542 pounds or 502 pounds per acre. Thirty-two acres of Canadian Gem yielded 10,177 pounds or 318 pounds per acre. The total area planted was 74 acres, and 30,437 pounds of seed was produced, an average of 411·3 pounds per acre. This was grown on land not entirely suitable as for the most part it was ploughed out of sod in the fall of 1917. The area on which this was grown was rented from farmers in the adjoining district.

Experiments were carried on to determine the distance apart most suitable for turnip seed production, and also the size of root most suitable. With rows 2½ feet apart the yields were about the same, from 16 to 24 inches apart in the row, and at a greater distance, the yields were reduced. The yields were greater from the area with rows 2½ feet apart than from those with the rows 2¾ and 3 feet apart. The yield from the roots 1 to 2 inches in diameter was 726 pounds per acre and from roots 4 inches and over 799 pounds per acre.

The early planting of roots for seed is very important, owing to the growth developed in storage as spring approaches.

The cost per acre, including rental of land and fertilizers, for two years covering the growing of the stecklings and the production of seed, and all work connected therewith for the two years, was $191.44 per acre, and at the average yield of 411·3 pounds per acre the cost per pound was 46·5 cents.

Thirty-four acres of stecklings were grown and stored for seed production in 1919, made up of 11½ acres of Canadian Gem, 15 acres of Corning Green Top and 7½ acres Ditmars Swede. These were stored in cellars in crates holding about 1 barrel each.

Almost one acre was planted to Danish Sludstrup mangel of roots selected in the fall of 1917 and grown at this Station. The yield was 1,407 pounds seed per acre.

HORTICULTURE.

The orchard embracing an area of nearly 47 acres planted in 1912-13 and 1914, has made strong growth, and in some cases trees have produced a few apples. The spaces between the trees have been utilized for growing various agricultural crops such as potatoes, corn and roots, and grains and clover following a three year rotation. A space at least three feet at each side of the row of trees is kept cultivated during the spring months.

Experimental work with vegetables was not carried on to any considerable extent during the past year. Variety tests were continued with potatoes and a number of tests to determine the distance apart it is best to plant, and the kind of set to use,

were continued. The crop on the whole was fairly satisfactory, the yield ranging from 200 to 400 bushels, and averaging 260 bushels per acre.

The lawns, shrubs and trees and flowering plants made splendid growth during the season. The lawns kept green during the whole season and the shrubs are now well established and are making quite effective groups. The flowering plants were a source of pleasure during the whole season.

The experimental orchard work which has been carried on at Berwick, Bridgetown and Falmouth, was continued and much definite information as to the influence of different sprays for apple scab control, and the use of different forms of poisons for insect control obtained. All the tests so far conducted would point to the importance of thorough spraying before blossoming. The tendency is to delay the spraying too long, resulting in scab infection on the leaf before the spray is applied, and from this the disease is spread to the fruit. Lime-sulphur arsenate has again given good results, and the fruit from trees sprayed with this has been superior to the Bordeaux sprayed fruit.

FARM IMPROVEMENTS.

Buildings.—The only building erected during the year was a pig house 60 feet long and 18 feet wide. The building is a shed roof construction 7 feet at the back and 11 feet in front. The ceiling is 6½ feet high, constructed of boards spaced about three-quarters of an inch apart and the space above this filled with straw. There are 5 pens 14 by 10 feet each and a passage way 4 feet wide at the rear, and a feed room 10 by 18 feet.

Clearing Land.—No additional land has been cleared during the year except to burn some brush at the rear of the farm.

EXHIBITIONS.

With the large amount of other work, we found it impossible to make an exhibit of farm produce at the shows held in Nova Scotia during the season.

AGRICULTURAL MEETINGS.

Agricultural meetings were attended at different periods throughout the year and addresses delivered on suitable topics.

EXPERIMENTAL FARM, NAPPAN, N.S.

REPORT OF THE SUPERINTENDENT, W. W. BAIRD, B.S.A.

THE SEASON.

The winter of 1917-18 was a typical Canadian winter. Perhaps an extraordinary depth of snow lay on the ground throughout. Cold, stormy weather continued during the first part of March, but the latter part of the month was very springlike. April was somewhat changeable with warm days and sharp frosty nights.

The weather during May was much warmer. A thunder shower was recorded on the evening of the 23rd, which was very beneficial to germination. A start was made in planting stecklings on the 10th and seeding commenced on the 15th.

Cool weather prevailed throughout June. Two degress of frost were recorded on the 19th and 20th. This frost did considerable damage in gardens throughout the neighbourhood.

The first three weeks in July were not at all summerlike. The last week, however, was fine and warm. Exceptionally fine weather continued during August, which afforded an excellent opportunity for hay making.

Several severe frosts occurred during the first week of September, doing considerable damage to garden crops. A heavy rain storm was experienced on the 21st; on which date high tides also prevailed. Dykes broke in many places and in the surrounding district much damage was done to hay on marshes.

October was somewhat unsettled and a heavy precipitation was recorded.

Fine weather was experienced until the 14th of November, when a heavy wind and snow storm was recorded. This storm did considerable damage throughout the county. Electric wires were broken down and light and telephone connections destroyed. Harvesting operations were considerably retarded.

December was very unwinterlike, being very much milder throughout than for the same period the previous season.

January on the whole was very fine, there being but one exceptionally cold day, the 11th. On this day a heavy blizzard was experienced.

Bright sunshiny days with frosty nights were experienced until the 26th of February.

On the evening of the 26th the heaviest snowstorm of the season was recorded, 7 inches of snow falling in all.

March has been unsettled with alternate rain and snow squalls.

METEOROLOGICAL RECORDS, 1918-19.

Month.	Temperature.		Precipitation.			Total Sunshine
	Highest.	Lowest.	Rainfall.	Snowfall.	Total.	
1918.	°	°	Inches.	Inches.	Inches.	Hours.
April	67	14	0·77	3·00	1·07	176·50
May	80	24	1·40		1·40	210·40
June	80	30	3·14		3·14	212·20
July	81	38	3·43		3·43	177·20
August	80	33	1·33		1·33	235·20
September	81	30	5·25		5·25	165·50
October	67	23	5·21		5·21	105·60
November	56	12	2·66	12·00	3·86	88·20
December	49	−3	1·22	14·00	2·62	57·20
1919.						
January	52	−13	1·24	3·25	1·56	86·70
February	39	2	0·48	15·00	1·98	101·70
March	53	0	2·24		2·24	120·90
Total for year			28·37	47·25	33·09	1,737·20

LIVE STOCK.

Horses.—The eighteen horses on hand March 31, 1919, at the Experimental Farm, Nappan, consisted of three matched spans of heavy geldings, four pure-bred Clyde mares, one medium weight gelding, two light horses used for express and driving work and five colts; two pure-bred Clyde fillies, one year old; one pure-bred Clyde filly, two years old; one pure-bred Clyde stallion, one year old and one light grade colt, one year old.

All horses are in good condition and the colts have made a most satisfactory growth during the season. Data regarding the cost of rearing colts to maturity are being collected.

Dairy Cattle.—The "grading up" experiment has now completed its sixth year's work. The object of this is to show the results obtainable from the use of a good, pure-bred, dairy sire on the average cow. Most satisfactory results have been obtained, as

indicated by the fact that in most cases, where the progeny is compared with that of the dams, the percentage of superiority runs from 14 to 71 per cent or an average of about 25 per cent, which is most encouraging. Moreover the striking evidence of the necessity of most careful and judicious feeding is brought out if the best and most profitable returns are to be expected.

Beef cattle.—During October of 1917 some forty-two steers of good beef type were purchased costing on an average $8 per hundred, live weight, and were sold in May, 1918, at $11 per hundred, live weight, leaving a spread of $3 between buying and selling price. The forty-two steers were divided into four lots and fed as per summary table, which gives in concise form the results of the test. It may be noted that the profits per steer range from $21.88 to $40.17 for the feeding test and that the daily rate of gain was from 1·58 pounds to 2·65 pounds.

The following table is a summary of the four lots fed, giving the main points of interest for comparison, 1917-18.

		How Housed.			
		Open Shed	Loose in Box Stall.	Loose in Box Stall.	Loose in Box Stall
		Lot 1.	Lot 2.	Lot 3.	Lot 4
		Roots and Meal.	Roots, Ensilage and Meal.	Roots and Meal.	Ensilage and Meal.
Number of steers		34	4	2	2
Average weight of steer at start	lb.	1,082	1,093	1,375	1,320
Daily rate of gain per steer	"	1·58	2·67	2·65	2·40
Cost of 1 lb. gain	cts.	19·23	11·43	14·50	12·97
Cost of feed per steer per day	"	30·52	30·52	30·52	30·52
Profit per steer	$	21·88	31·83	40·17	36·32

In November of 1918, twenty-four steers were fed. These were not of as good beef type as those fed during the winter of 1917-18, being a mixture of Guernseys, Holsteins and Shorthorn grade. They cost on an average $8.25 per hundred, live weight and were sold March 31, 1919 at $13 per hundred live weight, the highest price realized on the Montreal market for beef up to and including that time. The spread here, you will note, was $4.75—exceptionally good. These steers were divided into three lots of eight each. Lot one was subdivided. See summary table for results and method of feeding.

The following table is a summary of three lots fed together with the sublots of Lot 1, giving the main point of interest for comparison, 1918-19.

		How Housed.					
		Tied in Barn.	Loose in Box Stall	Loose in Box Stall	Tied in Barn.		
		Lot 1. Mixed Lot.	Lot 2. Good Beef Type.	Lot 3. Poor Beef Type.	Sublot 1. Grade Guernseys	Sublot 1. Grade Holsteins.	Sublot 1. Grade Shorthorn
		Feed.					
		Roots and Meal.	Roots and Meal.	Roots and Meal.	Roots and Meal.	Roots and Meal.	Roots and Meal.
Number of steers		8	8	8	2	2	2
Average weight of steers at start	lb.	1,013·75	1,067	930·75	863	1,053	1,058
Daily rate of gain per steer	"	1·875	1·62	1·866	2·52	1·80	1·91
Cost of 1 lb. gain	cts.	15·90	16·02	13·86	11·82	16·53	15·60
Cost of feed per steer per day	"	29·82	25·88	25·88	29·82	29·82	29·82
Profit per steer	$	43·25	46·29	42·76	43·66	44·24	45·78

From the above results one cannot but feel that there is more room for the finishing of good beef with fair profit for labour, feed and money invested and that these results should go toward encouraging a greater production of good beef cattle for they are surely needed.

Sheep.—Two flocks are kept at Nappan, one a good pure-bred Shropshire flock, the other a grade flock of mixed blood of Leicester and Shropshire. The ewes are all being bred to a pure-bred Shropshire ram. The pure-bred flock consists of 16 mature ewes, 10 two-shear, 12 shearlings, 1 mature ram and 1 shearling ram. There are, in addition to these, three more shear rams and 6 shearling rams for breeding purposes. These are for sale. The lamb crop for 1918 was good. Some 20 lambs were dropped during the season. The grade flock consists of 16 mature ewes, 6 grade two-shears, 6 grade shearlings. The lamb crop from these was fair. All wool from both flocks sold at an average price of 82 cents, which was the highest price realized for wool here.

Swine.—Three herds are kept at this Farm—one pure-bred Berkshire herd, consisting of three mature sows and two boars; one pure-bred Yorkshire herd, consisting of eleven sows and one boar; one grade Yorkshire and Berkshire herd, consisting of six sows and one boar. The past season has been a very successful one with the swine herds. Some seventy-one little pigs have been raised and fed as feeders, or sold as young pigs.

POULTRY.

A fairly successful year's work has been carried on in poultry; especially is this true of the latter part. Four breeds are kept at Nappan, namely, Barred Rocks, White Leghorns, Rhode Island Reds and White Wyandottes. The number of each wintered during 1918-19 are as follows: Barred Rocks, 25 hens, 40 pullets, 2 males, total 67; White Leghorns, 70 hens, 25 pullets, 4 males, total 99; Rhode Island Red, 11 hens, no males, total 11; White Wyandottes, 6 hens, 4 pullets, 1 male, total 11. Total eggs laid for the four winter months December, 1918-March, 1919, for Rocks was 1,402 at an average cost per dozen of 74·4 cents; for Leghorns, 2,338, at an average cost of 59·68 cents per dozen; for Rhode Island Reds, 392 eggs at an average cost of 70·01 cents per dozen; for Wyandottes, 275 eggs at an average cost per dozen of 76·32 cents. Total eggs set to date 200. The average per cent fertile was 89·5, which is good for early hatches.

BEES.

The past season was only a fair average year for honey production. The weather during June was not the most desirable kind for the bees to work. The highest one-day record of honey gathering by the individual colony which was kept on scales was 10 pounds; date of record July 13. Some fifteen colonies are kept. The average production per colony spring count was 63·8 pounds and the total extracted honey produced was 702 pounds, which sold readily at 20 cents per pound in ten-pound lots.

FIELD HUSBANDRY.

Rotations.—Three rotations are still being carried on at Nappan, namely, Rotation "B" (five years),—first year roots or corn; second year grain; third year clover hay; fourth year grain; fifth year hay, fall ploughed. Rotation "C" (four years),—first year roots or corn; second year grain; third year clover hay; fourth year pasture, fall ploughed. Rotation "D" (three years),—first year roots or corn; second year grain; third year hay, ploughed in autumn. Any of these are good rotation when used to suit the individual case. In any case some systematic method of rotation of crop should be adopted on any farm if the best returns are to be realized from the soil, with the least amount of labour and fertilizer expended.

Crop yields.—The total area of grain including test plots was 39 acres, 3 acres of which was in wheat, 2 acres in test plots of wheat, oats and barley; 27 acres in oats,

2 acres in barley, 2 acres in mixed grain and 2 acres in buckwheat, test plots, etc. The average for field lots of grain was for wheat 24 bushels 25 pounds; oats 36 bushels 27 pounds; barley 38 bushels 45 pounds; mixed grain 39 bushels. Wheat, barley and buckwheat were of excellent quality, but oats were only fair. In roots, including test plots, there were 10 acres. The average yield was 883 bushels per acre. Potatoes 1½ acres including test plots. The average yield was 255 bushels 35 pounds. The season, especially the latter part was most unfavourable for potatoes as the percentage of rot was the highest for years. The five acres of ensilage corn was a failure. The 41 acres of upland hay yielded an average of 2 tons 106 pounds per acre of good mixed clover and timothy hay. Owing to the dykes breaking several times during the last season and flooding the marsh badly the returns from same were very low. The 50 acres of marsh land only gave an average of 1,819·5 pounds per acre—the lowest yield ever taken off it. It will be several years before it is back to normal, but once back it should be better than ever.

CEREALS.

Thirteen varieties of spring wheat were tested in duplicate plots of one-sixtieth of an acre each. The highest yield this year was from Red Fife, 30 bushels 30 pounds; the lowest was from Bishop, 13 bushels 4 pounds. The average for all varieties was 24 bushels 17 pounds. Fifteen varieties of oats were tested, same kind and size plots as that for wheat. The highest yielder was Banner, 66 bushels 23 pounds; Daubeny lowest, with 39 bushels 24 pounds. The latter is an early ripening oat, but weak in the straw. The average for all varieties was 53 bushels 27 pounds. Three varieties of six-rowed barley were tested in duplicate plots of one-sixtieth of an acre. Stella gave the highest yield, 22 bushels 9 pounds. White Manchurian was the lowest, 20 bushels 22 pounds. The average for all plots was 21 bushels 9 pounds. Three varieties of two-rowed barley were tested in duplicate test plots of one-sixtieth of an acre each. The highest yielder of the two-rowed was O.A.C. Charlottetown No. 80, 33 bushels 6 pounds. The lowest was French Chevalier, 24 bushels 33 pounds. The average for all plots was 28 bushels 6 pounds, slightly better than the six-rowed barleys. Five varieties of buckwheat were tested in plots of one-twentieth of an acre each. Japanese gave the highest yield, 22 bushels 24 pounds. The lowest was rye, 9 bushels 28 pounds. The average for all plots was 17 bushels 12 pounds.

Field Crops of Grain.—One acre of Huron gave 25 bushels of beautiful wheat. In fact, Huron this year was much superior to any of the other varieties. One acre of Red Fife yielded 24 bushels 45 pounds of fair grain. One acre of Marquis gave a total yield of 24 bushels 30 pounds. The grain was of much better quality than Red Fife, but not quite as good as the Huron. The five acres of Banner oats grown for seed produced 227 bushels, or an average of 45 bushels 14 pounds. One acre of No. 80 barley yielded 42 bushels 31 pounds per acre of good seed grain. One acre of French Chevalier gave 35 bushels 12 pounds of very good seed grain. The past season was somewhat more favourable for barley than was the previous season.

FORAGE PLANTS.

Thirteen varieties of Indian corn were sown in test plots, but the crop was a failure, hence no record was kept on the yields.

Turnips.—Seventeen varieties of turnips were sown in duplicate test plots of one-hundredth of an acre. The highest yield was obtained from Good Luck, 24 tons 160 pounds, or 962 bushels. The lowest yield was from Monarch, 13 tons 1,900 pounds, or 558 bushels per acre. The average for all varieties was 18 tons 160 pounds, or 723 bushels 10 pounds.

Mangels.—Six varieties were tested in duplicate plots of one-hundredth of an acre. The highest yield was obtained from Half Sugar White, 14 tons 600 pounds, or 572 bushels. The lowest was Golden Tankard, 9 tons 1,400 pounds, or 388 bushels. The average for all varieties was 11 tons 816 pounds, or 456 bushels.

Sugar Beets.—Four varieties were tested in duplicate test plots of one hundredth of an acre each. The highest production was from Russian Crown, 6 tons 100 pounds, or 242 bushels per acre. The lowest was Ontario Champion, 4 tons 500 pounds, or 170 bushels per acre. The average for all crops was 5 tons 300 pounds, or 206 bushels.

Seed Production.—Some 16 acres were planted to turnip stecklings, Monarch being the variety used. The four best acres and first planted had a 90 per cent stand and gave a total yield of 4,800 pounds, or an average of 1,200 pounds per acre. The other four acres in this particular field gave only an average yield per acre of 256 pounds, or a total of 1,032 pounds, or average per acre for the full eight acres of 729 pounds per acre. The remaining 8 acres was on newly cleared ground. They were late when planted and many plants went bad at crown. The stand was not more than 50 per cent. The average yield per acre from this field was 271 pounds. The grand total for 16 acres was 8,000 pounds of good Monarch seed, or an average per acre of 500 pounds at approximate cost of 50 cents per pound. Ten acres more were sown to turnip seed for the production of stecklings for the season of 1919, but the ground was very wet; hence not more than a third of a yield was realized. The weather was very bad for harvesting same.

HORTICULTURE.

Fruits.—All large fruit gave a very satisfactory production. What it lacked in quantity it made up in quality, being very free from worms and scab. The canker worm throughout the orchard was again very much in evidence this year and caused much damage, especially to those orchards that were not sprayed. Some of the varieties in the new commercial orchard, which are just nicely starting to bear fruit, give promise of being good producers, such for instance as the Charlamoff, Arabka Winter, McIntosh Red, Wolfe River and Grimes Golden.

Strawberries.—Fifty varieties were tested in plots of $\frac{1}{528}$ of an acre each. Some of the most outstanding varieties and ones that can be recommended are Senator Dunlop, Williams, Beverwood, and Glen Mary. The six highest producers for the past season are Cole Seedling, yielding per acre 14,256 pounds; Haverland, 12,705 pounds per acre; Michaels Early 12,144 pounds per acre; Crescent 11,715 pounds per acre; Jas. Vick 10,494 pounds per acre and Williams 10,197 pounds per acre, all of which are good yields.

Bush fruit.—Practically all the bush fruits came through the winter in good condition and made splendid growth through the season, excepting gooseberry. These have never done well here especially the English varieties. Mildew and frost together seem to kill them out. All currants gave much better returns than for 1917. Many of the varieties doubled their yields. Raspberries came through the winter in good condition and made a very strong growth during this season, but did not fruit so well as in 1917. Possibly the growth was too strong.

Potatoes.—Thirty-one varieties of potatoes were tested in duplicate test plots of $\frac{1}{100}$ of an acre each. The highest yield per average of two plots per acre was obtained from Aarons Chief, 369 bushels 10 pounds. The lowest was from Dalmeny Beauty, 113 bushels 20 pounds. The average yield for all plots and varieties was 362 bushels 17 pounds.

Elite stock.—The improvement of the strain of Irish Cobbler, Green Mountain, Wee McGregor, Empire State, Carman No. 1 and Rawlings Kidney was continued as usual.

Shrubs.—Many of the taller shrubs, such as the arbor vitæ and spireas, suffered from the heavy falls of snow during the winter of 1917-18. Otherwise they came through the winter in fairly good condition and made good growth during the season. Perennials wintered well and made strong growth during the season. A few of the more tender ones got set back by the heavy frost in June.

Annuals.—Most of the annuals were started in hotbeds between April 10-18 and were transplanted into the open between the 3rd and 18th of June. Unfortunately they received a severe setback in the early stage of their growth after being set in the open by the heavy June frost, but after they recovered (those that did) they made a splendid growth and gave a most profuse bloom lasting well into the fall.

Seed production.—A start was made in the production of garden seed. As it takes two years to produce the seed of most of the garden stuff there is very little to report this season, other than that a start was made and some materials stored to work on next season.

Farm Improvements.—The new piggery which was started in 1917 was completed during the early part of the summer and given two coats of paint, making a most attractive looking building. The roof of the large main barn was shingled on both east and west sides, taking in all about 65,000 shingles. Ventilators were repaired. The roofs on the bull and calf barn and the old piggery were patched and renailed.

A new chimney was built in the harness room of the horse barn, also a big double chimney in the new piggery. All buildings were gone over and doors, windows, etc., repaired where it was found necessary.

Fences.—All line fences were gone over and repaired and a new portion of 1,500 feet of badly broken-down pole fence was replaced with a woven wire fence.

Draining.—About four acres of field B3 were underdrained with three-inch tiles, thus completing the field. Two or three acres of the north end of B2 was also laid with three-inch tiles. A large six-inch main was laid from the northeast corner of B2 down through the lowest portion of the field coming out at about 100 feet north of the southwest corner. A large six-inch main was laid just at the south end of B2 and B3, running west to connect with the old main about 75 feet east of the southwest corner of B2. Part of the drains from B3 empty into these mains. Another six-inch main drain was laid through the swamp of the newly cleared field north of main driveway at the back end of the Farm. About three acres of this swamp was laid to three-inch tiles, emptying into the main. On the south side of the Farm next to the Roach property and in the newly cleared field another four acres was laid with three-inch tiles. Owing to weather conditions and influenza these two swamps could not be completed last fall, but will be this coming season.

Barnyard.—As the stones were gathered off the fields they were hauled into the yard, thus enlarging the stone portion of the yard very materialy. This yard, when completed, will be a permanent job.

Farm road.—All farm roads were repaired during the season and put in good shape by cultivating and harrowing as often as necessary to keep down the weeds. The split log drag was used to keep them rounded so that the water would run off readily. The main road from Farm to station was also put in good repair and ditches cleaned out thoroughly in order to get proper drainage. One of the most essential things in the upkeep of good roads is proper drainage. Owing to the dykes breaking and marshes flooding this road was badly washed and gullied out. A good cinder sidewalk was also built from the Farm to the station, all of which adds much to the general apearance of the Farm approaches.

Marsh land.—Because of the dyke breaking during the high run of tides during October, much damage was done to the marsh lands. Then there was considerable

expense in getting them repaired. Weather conditions were bad; influenza was raging at the time and help was next thing to impossible. Hence a dyking machine was used for the building up most of the new dyke. While it is doubtful whether the machine is any cheaper than doing the work by spade this can be said that where a new dyke is being built there can be a more substantial dyke built at just the same cost as by hand, but it takes a little more land to do it. However, once it is grassed over the dyke is a more secure one. About 600 feet of new dyke was built and much repair work put on the old dyke where weak spots were noted.

Excursions and Visitors.—Two large excursions were held at the Farm during the season and seven or eight smaller ones. The largest was that held by the Cumberland County Farmers' Association, at which addresses were given. The attendance was over 3,000. The next was held by the Orangemen. The attendance at this picnic was about 2,000. Then there was a small excursion from Point de Bute, N.B.; one from Sackville district, N.B.; one from Joggins and River Hebert and one from Southampton and West Brook district. Altogether the visitors to the Farm during the season would number approximately 6,000.

Meetings and Exhibitions.—During the year the Superintendent attended many meetings and acted as judge at ploughing matches as occasion called for. The following is a list of same: April 24, Town garden lot meeting, Amherst, N.S.; April 26, Sheep Shearing demonstration, Experimental Farm, Nappan, N.S.; June 20, Town garden lot cultivation meeting, Amherst, N.S.; September 18, ploughing match at Amherst, N.S.; October 15, ploughing match at Truro, N.S.; December 3, Poultry Show at Halifax, N.S.; December 10-11, Poultry Show at Amherst, N.S.; January 21-23, Fruit Growers' meeting at Bridgetown, N.S.; March 12, Dairymen and Farmers' Association meeting at Fredericton, N.B.; March 18, Agricultural meeting at Williamsdale, N.S. One lecture a week was given to guards at Detention Camp, Amherst, N.S., from November to March.

A farm exhibit was put up at the following exhibitions—Inverness, September 9-12; Antigonish, September 23-24; Stewiacke, September 26-28 and Sydney, October 1-6.

EXPERIMENTAL STATION, FREDERICTON, N.B.

REPORT OF THE SUPERINTENDENT, W. W. HUBBARD.

THE SEASON.

The winter of 1917-18 was one of the coldest and stormiest on record in New Brunswick. After freezing on November 7, the ground did not again thaw. Two inches of snow fell on November 23, followed by a cold rain, covering the ground with ice. December brought a snowfall of eleven inches on the 2nd, followed by cold and high winds; eight inches more snow fell during the month. The mean temperature for December was 9·8 degrees against a forty-three-year average mean of 19 degrees. There was no thawing weather during January, but almost continuous high winds, intense cold and thirty-two inches of snowfall. The mean temperature was 8 degrees against an average of 13 degrees. February brought a continuation of the January weather with a slight thaw in the latter part, which settled the snow somewhat. The sunshine for February was only 90 hours, approximately two-thirds of the normal average for that month. March continued cold and rough with a temperature of 20 degrees, 6 degrees below the average. Snow went off rapidly towards the last of the month. April brought warm days and frosty nights with sunshine above the average. There was but little rain, but the great depth of snow furnished abundant soil

moisture. May was fairly warm with no frost after the fifth, dry and favourable for work on the land. June turned cold, with frost in some localities every week, destroying tender crops and even potatoes. July, during the first fifteen days, brought continuous wet weather, aggregating five inches of rainfall and drowning out crops on low lying lands, and preventing cultivation, gave weeds generally a tremendous start. Temperatures were normal, but only half the usual sunshine. Late blight started among early potatoes and caused much loss later on. August was cool and dry and so was September up to the 11th, providing good harvest conditions, but the latter half of the month brought a deluge, with six inches of precipitation and very little sun, seriously damaging late grain and flooding potato and root fields. The first week of October was wet, but after that dry, warm conditions enabled the harvesting of potatoes and roots in good order. November followed with mild, dry weather, roots were handled up to the 15th and ploughing continued till the 23rd. The winter months following were the finest ever experienced in New Brunswick. Snow came on Christmas day and gave an even covering. The snowfall in January was thirty inches, with a notable absence of wind. February was bright and mild and there was no thawing weather until after March came in, when there was a break up of roads and ice, after which fields were practically bare.

METEOROLOGICAL RECORDS.

Month.	Temperatures F.			Precipitation.			Sunshine.
	Mean.	Highest.	Lowest.	Rainfall.	Snowfall.	Total.	
1918.				Inches.	Inches.	Inches.	Hours.
April..	39·7	67·5	18	2·44		2·44	192·05
May..	53·5	88	28	2·21		2·21	209·05
June..	57·4	86	34	3·06		3·06	218·65
July..	66·3	90	48	5·57		5·57	122·9
August..	62·3	86	42	1·52		1·52	239·5
September	55·4	76	31	7·62		7·62	124·99
October.	47·9	67	27	3·36		3·36	141·7
November	32·8	61	11	3·82		3·82	86·15
December	20·2	48	−6	·34	8·5	1·19	76·65
1919.							
January	13·9	39	−18	1·02	32	4·22	71·7
February	20·6	39	−17	Nil.	15·5	1·55	124·8
March	29·59	55	− 7	2·25		2·25	159·55
				33·21	56	38·81	1,764·69

LIVESTOCK.

Horses.—Three pure-bred Clyde mares, six grade Percheron mares, one grade Percheron gelding, one grade Clyde gelding, two grade draught geldings, one driving mare and a general purpose gelding were used on the Station during the year. A pure-bred Clyde filly, a grade Clyde filly, three grade Clyde colts, a grade Percheron colt, a grade Percheron filly and a half-bred colt, varying from weanlings to two-year-olds, were reared. Two three-year-old grade Percherons were kept on cheap winter rations at a cost for three months of $13.48 each. The grade Percheron mare weighed 1,430 pounds on December 31, 1918, and 1,425 pounds on March 31, 1919. The grade Percheron gelding weighed 1,435 pounds on December 31 and 1,380 pounds on March 31.

Dairy cattle.—The pure-bred herds of Dairy Shorthorns, Ayrshires and Holsteins were somewhat increased by births and some very promising heifers of these breeds are coming in. The best Shorthorn cow from November 17, 1918 to March 31, 1919 gave 6,999·1 pounds milk, 272·6 pounds butter in the 138 days, a per diem yield of 50·7 pounds milk and 1·97 pounds butter. The best Holstein from January 20 to March

31 gave 3,882·1 pounds milk and 153·4 pounds butter, a per diem yield of 55·4 pounds milk and 2·19 pounds butter. In the grading up experiments, first cross Holsteins nearly all completed their first lactation periods and in all but two cases there was a substantial improvement in yield over their dams. The first-cross Dairy Shorthorn heifers are coming in and making a showing that will place them in most cases well ahead of their dams' records. A very nice lot of first cross Ayrshire heifers will be bred during 1919. A number of bull calves have been sold during the year to New Brunswick farmers. A thorough and very satisfactory test of wheat screenings, known as Standard Stock Food, was made on the dairy herd. The cost of rearing dairy heifers from birth to calving is being kept but complete records are not yet available. On account of lack of stable room and the very high price of hay, no feeding cattle were put in. Some grade cows, as they approached the end of their lactation period, were disposed of for beef.

Sheep.—Pure bred Shropshires and grades did well during the year, raising a good crop of lambs in 1918. A flock of Cheviots, eight ewes and a ram, was purchased and has given a good crop of lambs in 1919. Ram lambs were sold for breeding purposes and ewe lambs kept.

Angora Goats.—Three goats died during the year, one from pneumonia, one from wool balls in the stomach and one from blood poisoning. The eight remaining females in 1919 have dropped ten kids, all of which are healthy and growing. While the flock in the summer of 1918 undoubtedly destroyed many bushes, they were too few in proportion to the size of the pasture area to show what they could do as efficient bush killers.

Swine.—The five pure-bred Yorkshire sows gave spring and fall litters. There was a keen demand for the spring pigs for breeding purposes, but the fall litters would not sell and have been kept on. These pigs were given dry, closed-in sleeping quarters and daily exercise in a sheltered yard and not one case of sickness or lameness was noticed. The sows were wintered in the yard with small cabins for sleeping quarters and fed largely on mangels.

POULTRY.

The pure-bred flocks of Barred Rocks, White Wyandottes, Rhode Island Red and White Leghorns were kept on and some good males were purchased or received from the Central Experimental Farm. The laying flock has averaged about 275 birds. All laying hens have been trap-nested and so far as breed is concerned there is not a great difference in yearly egg yield, but there are individual hens in each breed that far outstrip others in number of eggs laid. A few turkeys were added during the year, but the mortality was very heavy while they were small and while they were shooting the red. The principal trouble seemed to be the result of the Blackhead disease causing ulcerated livers and generally sudden death.

BEES.

The severe weather of the winter of 1917-18 was adverse to the successful out-door wintering of bees. Out of six colonies from 1917, only two survived; these were increased to six by swarming and division and four colonies were purchased. These went into winter cases weighing from 64 to 72 pounds each. Two were placed in individual cases in the honey-house and eight in the winter cases. The two colonies in the house are apparently strong and all but one in the winter cases show signs of spring strength.

FIELD HUSBANDRY.

The crops most extensively grown were oats, potatoes and turnips. Oat seeding began on May 18 and was completed on the 3rd June. The total acreage was forty-

eight and three-quarter acres and the crop aggregated 1,641½ bushels, an average of 33⅜ bushels per acre. Of the total area, twenty acres was seriously damaged by flooding and gave only 15 bushels per acre, so that on the well-drained land the yield was 46⅓ bushels per acre. The varieties were Banner and Ligowo. Three acres were sown to White Fife wheat on the 7th and 14th May and gave a crop of 70 bushels. There was slight damage from bacterial disease but in the main the sample was good. Twelve acres sown to buckwheat gave 317 bushels of grain with at least 60 bushels shelled in the field on account of heavy rains in September and the handling necessary in drying. Four acres of buckwheat on undrained land was flooded and from it only 28 bushels was recovered.

Winter rye, heavily pastured the preceding fall, gave a yield of 20 bushels per acre. Four acres seeded on the 17th September has come through the winter with about 20 per cent loss from winter-killing.

An acre of Dawson's Golden Chaff fall wheat has come through the winter with not more than 10 per cent loss.

Field beans yielded from 10 bushels to 24 bushels per acre according to variety and freedom from disease.

Turnips were considerably damaged by aphis. The total area was approximately nine and one quarter acres, with a gross yield of 95 tons 1,140 pounds. The yield varied in different areas from 17 tons per acre down to 9½ tons.

An acre and one-half of mangels yielded at the rate of 14 tons 1,868 pounds per acre. Field carrots gave a yield of 136 bushels per acre on one area and 380 bushels on another.

The hay yield from 36 acres was 73 tons 1,530 pounds.

Silage corn was practically a failure. Weather conditions prevented the early preparation of the land and seeding was delayed till the 12th of June. Fourteen acres were planted and the crop was cut and bound on the 8th and 9th October, after there had been some searing from frost. The yield after drying out somewhat in the field was 68 tons 370 pounds, and the silage was of poor quality; frost penetrated 18 inches from the walls of the stave silo. The varieties grown were White Cap, Yellow Dent and Wisconsin No. 7.

FERTILIZER EXPERIMENTS.

A new series of experiments comprising sixty-eight twentieth-acre plots was inaugurated with potatoes to test the effects of various combinations and quantities of nitrogen, phosphoric acid and potash compared with an application of one ton of a 4-8-10 mixture per acre. This experiment will be carried through a three-year rotation with oats in 1919 and clover hay in 1920. No field or garden experiments were conducted, the work planned having been concluded in 1917. No fresh work was undertaken on account of the special effort being made to grow field root seed.

CEREALS.

Variety tests with wheat, oats, barley and peas were continued with seven varieties of wheat, five of oats, six of barley and five of peas. The yields were almost double those of 1917. In wheat, Early Red Fife gave the best yield with 30 bushels per acre. In oats, Victory led with 45 bushels per acre. The new barley "Stella," bred at the Central Experimental Farm, was the best variety of that grain with 35 bushels per acre. Peas were badly damaged by the wet weather in September and 14 bushels of a very soft sample was the best yield; Arthur and Brittany standing equal.

FORAGE CROPS.

No variety tests were conducted and the field crops have been reported on under Field Husbandry.

A considerable acreage of turnip stecklings was grown in the autumn of 1917, but they did not winter well and only three acres of seed plants were set. Those that wintered in the field came through well until April, but that month brought bright, warm days with freezing nights which destroyed a large proportion of the roots. On account of the wet weather in September, there was difficulty in getting the seed dried for threshing. Nine hundred and twenty-five pounds of a good sample was recovered. The variety grown was Sutton's Champion. Twelve acres of turnip stecklings were grown and stored in cellar and pits for seeding in 1919.

FLAX.

A half acre of flax was grown for fibre and a good sample was obtained and shipped to the Central Experimental Farm for fibre test.

HORTICULTURE.

Large Fruits.—The apple orchards continue to make good progress. The majority of the trees came through the winter in good condition and made strong wood growth during the summer. A few trees in the variety orchard were broken with snow. Some of the earlier varieties of apples bore their first fruit in 1918. Pears, plums, and cherries suffered considerably from winter-killing. No fruit was produced in this orchard this season although considerable bloom was shown.

Bush and Small Fruits.—The bush fruit plantation gave very disappointing returns, red and white currants and gooseberries bore practically no fruit and the black currants gave only a fair yield. No results were obtained from the strawberry plantation as nearly all the plants were killed when the straw covering was accidentally burned in the early spring. The vineyard is making good progress and only a few vines have died. One or two varieties bore a small quantity of fruit during the season but it did not mature.

Vegetables.—Variety tests of vegetables were discontinued in 1918 and the most of our attention given to the production of vegetable seed. Fortieth-acre plots of spinach, radish, carrots, beets, parsnips, onions and cabbage; a half-acre plot of peas and an eightieth-acre plot of celery were grown for this purpose. All of the annual vegetables produced seed in abundance but the very unfavourable weather that prevailed at harvesting time materially reduced the yield and in the case of the peas, ruined the entire crop. The biennial vegetables are being carried through for seed production in 1919.

Potatoes. Experimental work with this crop was continued along the lines of previous years and crops of Green Mountain, Irish Cobbler and Improved Burbank were grown for seed distribution. A total of 13½ acres was planted to potatoes, excluding 2¼ acres devoted to variety, disease and spraying tests, the yield from the remaining 11¼ acres was 2,472 bushels of which 2,295 bushels were marketable. The per acre yield was 21½ bushels.

On the acre devoted to a test of cost of production, the yield was 288¾ bushels of marketable tubers and 9¾ bushels small. The cost was $118.07, the value of the crop at current price when dug (3 per barrel) was $317.62.

In conjunction with the Entomological Branch, an extensive test of insecticides was made in combined sprays. The average per acre yield from 24 Bordeaux plots where the foliage was not injured was 41 bushels. The average per acre yield of 8 check plots was 238 bushels. Dust spraying gave 119 bushels per acre. On the plot

where potassium sulphide was used in the spray, the yield was 484 bushels per acre, leading to the suspicion that potash may be absorbed into the circulation of the plant from the spray.

The season was not favourable to large yields of potatoes and on check plots and areas not sprayed there was a great deal of late blight. The general use of arsenate of lime as an insecticide was very satisfactory.

Flowers.—The usual variety and cultural tests of annuals, perennials and bulbs were carried out and the general display of flowers was as popular as ever.

FARM IMPROVEMENTS.

A root cellar was built for the storage of roots for seed growing and to take the surplus field and garden roots, etc. The dimensions are 25 feet by 50 feet with stone walls and cedar top covered with two feet of earth. This cellar has a driveway through it and provided most satisfactory storage for stecklings, there being practically no loss when the roots were spread about 15 inches deep on the floor. The cost of this cellar was $1,050.

CLEARING LAND.

Very considerable work was done in blowing and removing boulders and stones from various fields. Stumps were removed, piled and burned on five acres of new land. Bushes were cut and burned on some thirty acres of pasture land.

DRAINING.

Tile drains were laid under five acres.

EXHIBITIONS.

Exhibits were made at the Charlotte County Exhibition, St. Stephen, N.B., at the Potatoe Growers' Convention and Show at Woodstock and at the Provincial Seed Fair at Fredericton. Applications were received at these shows for seed samples and considerable literature distributed.

MEETINGS ATTENDED.

The superintendent and assistant to the superintendent attended and gave addresses at the exhibitions and at a few other meetings in the province.

EXCURSIONS.

The Farmers and Dairymens' Association of New Brunswick conducted an excursion to the Station on the 14th March, when two hundred and twenty-five delegates from all parts of the province were in attendance. After a general inspection of the stables and various farm departments lunch was served and addresses then given by the Acting Director and the superintendents of the Experimental Stations at Kentville, Nappan and Fredericton and the assistant to the superintendent of the Fredericton Station. Live stock judging demonstrations were conducted with both horses and cattle.

EXPERIMENTAL STATION, STE. ANNE DE LA POCATIERE, QUE.

REPORT OF THE SUPERINTENDENT, JOSEPH BEGIN.

CHARACTER OF SEASON.

The winter of 1917-18 was the most severe that has been experienced in a number of years. April, however, opened up fine and dry, the snow melting so gradually that not even the most exposed of the land was flooded. The soil, however, remained frozen until the last of the month, so that no seeding was done, except on a piece of well-drained land, towards the last of April. May was so rainy that not until the 18th did seeding operations begin in general in the district. The usual precipitation was doubled during May, June and July, thus seriously hindering germination and proper growth. August was very dry. The hay crop, which was average, was harvested in good condition, but, September being rainy, the grain was harvested with difficulty. The end of autumn, however, was very favourable for the harvesting of the crop of potatoes. The winter of 1918-19 was remarkable as to the heavy fall of snow throughout the season, and, on March 31, the fields throughout the district were still covered with snow.

METEOROLOGICAL RECORDS.

Month.	Temperature.					Precipitation.			No. of Days.		Sunshine.
	Date.	Max.	Date.	Min.	Mean.	Rain.	Snow.	Total.	Rain.	Snow.	
1918.		°		°	°	Inches.	Inches.	Inches.			Hours.
April ..	27	65·4	9	24·4	38·2	1·25	.	1·25	3	.	236·5
May....	17	80·4	2	30·6	49·4	4·14	1	4·24	15	1	208·8
June	2	81·4	18	33·0	54·8	5·13	.	5·13	12	.	221·7
July....	28	87·4	8	38·8	59·7	6·73	.	6·73	14	.	217·1
August.	22	81·4	16	35·0	56·7	1·01	.	1·01	6	.	242·4
September. .	4	74·2	27	32·8	47·6	6·60	.	6·60	20	.	124·6
October..	10	63·7	22	31·0	43·1	0·60	1	0·70	5	1	122·2
November.	3	54·3	30	8·8	32·2	0·52	7	1·22	6	4	75·1
December	22	42·5	7	−4·2	16·0		8	0·80		7	64·7
1919.											
January	1	38·2	11	−23·8	12·6		31	3 10		6	82·6
February	26	34·9	12	−4·3	17·7		22	2·20		8	134·8
March. .	19	56·2	15	−3·2	24·0	0·35	33	3·65	3	10	130·6
Totals .	.	.	.	.	.		103	36·63	84	37	864·1

LIVESTOCK.

Horses.—Fourteen draught horses, two colts two years old and one filly one year old were wintered at the Station. Four draught horses, not suitable to raise, were sold the previous fall. Eight good mares, weighing from 1,550 to 1,750 pounds, of which five are registered Percherons of high breeding, are kept on the Farm for a dual purpose: for work and for breeding purposes. The total number of hours of work of the above-mentioned horses was 30,782 hours or an average of 1,710 hours per horse or a daily average of 5·7 hours per horse. This average, taken as a whole, would mean a daily average of 6·6 hours per horse for the horses which worked all year. Two mares foaled in a period of 172 and 180 days respectively. It is thought better that the mare's work be sacrificed to the raising of the colt.

Cost of Raising Colts.—A Percheron colt born on the 12th of February, 1917, consumed the following feed from April 1, 1918, to March 21, 1919: oats, 4,965 pounds,

bran, 461 pounds, hay, 4,042 pounds, roots, 585 pounds, and pasturage for 4 months at $2 per month. The price of the above may be reckoned from the following: Grain, 1½c., roots, $2 per ton, hay, $7 per ton, and straw, $4 per ton. At these figures, the total cost of feed amounts to $92.75. Increases in the weight of this colt are here shown: April 1, 1918, 1,175 pounds, June 30, 1,280 pounds, September 30, 1,415 pounds, December 31, 1,510 pounds, and March 31 1919, 1,625 pounds. The colt was wintered out-of-doors, having a shed 15 feet x 18 feet with an opening to the south. This method of wintering, little known in this section, attracts the attention of many visitors. The apparent comfort, the regular development and vigorous growth tend to show that this method is advantageous in the raising of colts. However, wintered out-of-doors, a colt is bound to consume more, especially grain, but the surplus expense is largely compensated for by the remarkable vigour of the animal. The total cost of maintenance, at the prices above mentioned, amounts to $155.86.

A Percheron filly, born April 11, 1917, cost $128.32 to the end of March, 1919, a total time of 719 days. The feed consumed by this filly for the past year was: Oats, 3,143 pounds, bran, 538 pounds, mixed hay, 3,939 pounds, 4 months' pasture at $2 per month, roots, 536 pounds and straw for bedding, 1,095 pounds. The total cost was $69.99. This filly was wintered in the stable. Its weight on April 1, 1918, was 1,125 pounds, while on March 31, 1919, it weighed 1,560 pounds. It is to be noted that the increase of the weight of the filly was 335 pounds as compared with that of the colt at 450 pounds, during the same period. The food consumed was the same in quality and quantity except that the colt wintered out-of-doors had 1,822 pounds of grain more, which is explained by the fact that the colt, being out-of-doors and having more exercise, could assimilate the greater quantity required for its nourishment.

Cattle.—The cattle at the Station consist of 33 head of pure bred registered Ayrshires comprised as follows: 1 very good herd-bull, 5 bull calves one year old, 14 milch cows, 8 yearling heifers, and 5 of this year. The grade herd consists of 5 old cows, 5 of three and four years of age, of first blood Ayrshires, 4 heifers of one and two years, 5 heifers of this year and two of this year second blood Ayrshires, making a total herd, grade and pure, of 54 animals. Nine young Ayrshire herd-bulls from 4 to 11 months old were sold to breeders and breeders' associations in this district. Two adult Ayrshire cows and three grade cows were also sold during the year. 26 cows, 19 adult and 7 young, in their first period of lactation stopped milking during the year. The average length of the lactation period of the herd was 303 days. The total amount of milk for the year was 136,069 pounds; the average in butter fat was 4.01654 and the total production of butter was 6,429.72 pounds. The total cost of feeding the cows during their lactation was $1,455.50 considering which, the cost per hundred of milk would be $1.06983 and of 1 pound of butter, $0.2264.

Swine.—A good boar and 6 sows, Yorkshires, are kept on this Station. Some good young sows will be added to these. At present, the total number is 29, of which 6 sows are due in April and May. Five young boars were sold to breeders in the course of the past year, as well as 36 pigs for the market, the latter realizing a total of $1,386.64. Particularly unfavourable circumstances have prevented any experiments in feeding during the year.

Sheep.—A Shropshire herd is in the process of formation, at the same time as a gradual improvement is being made by the use of a good Shropshire ram. At present there are two good rams, 28 ewes pure-blood and first-blood Shropshire, and 22 lambs.

POULTRY.

Experimental work in agriculture during the past year was somewhat disorganized owing to the scarcity of help and the cost of feed. The damp, cold weather of the season was also a serious obstacle to obtaining the best results. 36 White

Wyandotte hens and 50 pullets, and 40 Barred Rock hens and 46 pullets were wintered at the Station. The season was one of the most unfavourable for the production of eggs and the raising of chickens. The total number of birds sent to the market was 115, with a weight of 527 pounds and selling for $173.91. 12,967 eggs were produced at the Station during the year.

Bees.—The bees kept at this Station are Native Blacks and Italian Hybrids. Of the eighty colonies which were wintered in the cellar, 2 were lost, possibly owing to the lack of sufficient population in the hive. Eight colonies in wintering cases came out strong in the spring. The season being late, cold and rainy, the bees were unable to obtain as much nourishment as in previous years. Although the season was short, the production was very good, but possibly 40 per cent of the production was lost. However, although the season was practically ended by the first of August, an average of 95 pounds per colony was realized, the greatest production for one colony being 225 pounds.

FIELD HUSBANDRY.

Rotations.—Four rotations of three, four and five years were carried on during the year, the four-year rotation being in duplicate on land of the same nature, except that one parcel was well-drained and the other was not drained. The three rotations produced crops permitting the proper products to be grown for milk production and the raising of young stock on the Farm. The 3-year rotation is mainly for small farms where the natural pasture permits the increase of livestock, but, although yielding heavier crops, it requires more work. This rotation is generally adopted on many eastern farms. The 4-year rotation permits the improvement of the farm and is intended for those desiring greater cereal crops.

Cereal Crops.—On the regular rotations, the average yields were as follows:—

	Bushels.	Pounds
Huron wheat	44	56
Marquis wheat	43	4
Ruby wheat	38	28
Banner oats	72	10
Daubeney Oats	67	4
Ligowo oats	69	18
Manchurian barley	42	12
Albert barley	38	18
No. 80 (Charl.) barley	38	10
Albert barley	35	15
Arthur peas	30	22

Forage Plants.—Difficulty in procuring seed hindered the usual tests being continued in maize and forage crops during the year.

HORTICULTURE.

Forced by unfavourable circumstances, the greater part of the experiments and tests of varieties were suspended for the past year. A certain quantity of vegetables was grown with a view to determine the cost of production of the seed. The potato crop yielded about 326 bushels per acre, of which 284 bushels were saleable. This is a good record, considering the unfavourable conditions in this district last year for the culture of potatoes.

Orchards.—The past season is a record one with regards to the disastrous results in the orchard, especially in the culture of European plums. It is estimated that about 52 per cent of the plum crop was destroyed, 80 per cent of the pears, 20 per cent of the cherries and about 5 per cent of the apples. The plum crop was practically nothing, the apples about a 60 per cent average and the small fruits only a half crop.

Hedges.—A hedge of 640 rods, running around the north and west sides of the orchard, was planted in the autumn of 1917 to serve mainly as a wind-break for the orchard. It consists of fir trees planted at intervals of five feet as a permanent hedge, with Lombardy poplars also as a temporary wind-break. Flowers were also planted on each side of the hedge and formed a centre of attraction for many visitors. A large quantity of the seeds, perfectly ripened, were gathered in good condition.

SPECIAL CROPS.

Twenty-five acres, sown for the production of stecklings, gave a good yield, at an average of about 14 tons to the acre. An acre of flax was cultivated for fibre, yielding 3,850 pounds, which was sent to Ottawa.

IMPROVEMENTS, ETC.

The calf barn, started in 1917, was completed with all modern accommodations, including ten stalls for calves and young stock, one large stall for two young calves, and a granary, the upper part being large enough to hold considerable forage. Some thousands of feet of drain were laid to improve a certain field. Considerable fencing was done as well as a number of stone taken off the fields and used in improving the roads. Exhibitions were held and at these a strong impression was left regarding the demonstrations of the Farm, the methods of culture and the advantages gained thereby.

VISITORS.

No less than 6,500 farmers from the East visited the Station during the year. Three Agricultural Days were held during the year, at which hundreds of farmers were present. Excursions of considerable interest and importance were also held during the fine season.

EXPERIMENTAL STATION, CAP ROUGE, QUE.

REPORT OF THE SUPERINTENDENT, G. A. LANGELIER.

CHARACTER OF THE SEASON.

The six months during which plants make their growth in Central Quebec were a little colder and brighter, but much wetter than the average for the last seven years, the mean temperature being respectively 55·87 and 56·27° F., the number of hours of sunshine 1,096·9 and 1,074·3, the precipitation 34·01 and 25·92 inches. The frost-free season was shorter than usual, being only 129 days, from May 5 to September 11.

The following were very good: hay, garden roots, early peas and beans, whilst early potatoes, oats, barley, wheat, onions, celery, cucumbers, lettuce, strawberries, currants, gooseberries, perennials, ornamental plants and bushes were good, sweet corn, cabbage, late potatoes, melons, squash, apples, cherries, grapes, raspberries, annual ornamental plants were medium, and corn for silage, swedes, late beans and peas, tomatoes, plums and pears were poor crops.

METEOROLOGICAL RECORDS, 1918-19.

Month.	Temperature F.			Precipitation.				Total Sunshine.
	Highest.	Lowest.	Mean.	Rainfall.	Snowfall.	Total.	Heaviest in 24 hours.	
1918.	°	°	°	Inches.	Inches.	Inches.	Inches.	Hours.
April	68·0	14·2	52·48	1·92	...	1·92	0·67	220·3
May	83·0	30·2	53·52	4·33		4·33	0·77	181·9
June	82·0	34·2	56·76	6·77	...	6·77	1·90	210·9
July	88·0	46·2	66·69	6·96	...	6·96	2·76	231·0
August	83·0	39·2	62·64	2·90		2·90	1·08	239·1
September	79·0	30·2	51·79	9·52		9·52	1·66	118·1
October	61·0	26·2	43·83	3·53		3·53	0·84	115·9
November	53·0	9·2	32·30	1·82	7·40	2·56	0·50	64·4
December	40·0	− 5·1	18·47	2·37	21·90	4·56	0·95	47·2
1919.								
January	37·0	−19·9	13·02	0·20	33·10	3·51	0·80	45·9
February	34·0	− 7·0	16·88	2·25	22·50	2·25	1·20	107·5
March	49·0	−10·0	24·82	2·15	29·00	5·05	1·20	113·2
				42·47	113·90	53·86		1,695·4

LIVE STOCK.

In general, the live stock kept in very good condition throughout the year.

DAIRY CATTLE.

The herd numbered 47 head on March 31, 1919, 43 of which were pure-bred and 4 grade French Canadians. They are kept for five purposes: supplying milk to the dairy, experimental breeding, experimental feeding, experimental housing, and distributing high-class breeders at reasonable prices.

Milk Production.—Thirteen heifers and cows, ranging in age from 2 to 12, finished a lactation period during the fiscal year. Their average production was 5,952 pounds of milk, testing 4·2, which is equivalent to about 300 pounds of butter per animal per year. One young cow gave more than 500 pounds of butter, and the three best ones over 475 pounds each, which shows that when the "boarders" are all weeded out the average for the herd will rise considerably.

EXPERIMENTAL BREEDING.

Grading Up a Dairy Herd.

Project No. 1.—The object of this experiment was to find out if heifers out of grade cows, by a pure bred bull, would be better milkers than their dams. It was started in 1911 and not a heifer has been good enough to keep in the herd, the probable reason of this being that the sire used was out of a low producer. This means that a farmer who wishes to improve a dairy herd must get something besides a pedigree.

EXPERIMENTAL FEEDING.

Work was continued on the three following projects: Whole milk vs. skim milk and supplements for calves, feed requirements of heifers until calving time, extra good vs. average rearing of heifers as influencing size, type also production of the mature cow.

Whole Milk vs. Skim Milk and Supplements for Calves.

Project No. 3.—Three lots of calves were fed differently until twenty-four weeks of age, one bunch receiving whole milk, the second skim milk and commercial calf meal, and the last skim milk and home mixed calf meal, consisting of 6 parts corn, 3 parts oats, 1½ parts flax seed, by weight, all ground together. Calculating whole milk at $2, skim milk at 25 cents, home mixed calf meal, also commercial calf meal, at $5 per 100 pounds, bran at $40 per ton, hay at $15, silage and roots at $4, it cost $49.31 for each of the skim milk calves, $16.45 for each of the commercial meal calves and $16.33 for each of the home mixed meal calves. This experiment will be continued, but the results, to date, show that whole milk is much too costly, also that the home mixture is as good as the commercial calf meal.

Feed Requirements of Heifers until Calving.

Project No. 4.—Everything given to six heifers was weighed until they calved, when their age averaged 25 months 20 days, their weight 777 pounds, and their feed 692 pounds whole milk, 5,993 pounds skim milk, 736 pounds meal, 2,902 pounds hay, 177 pounds green stuff, 4,326 pounds roots, 5,660 pounds silage, besides 97 days at pasture. Valuating the whole milk at 2 cents per pound, the skim milk at 25 cents per 100 pounds, the meal at 2 cents per pound, the hay at $15 per ton, the green stuff at $6 per ton, the roots and the silage at $4 per ton, the pasture at $2 per head per month, it cost $92.23 for feed only to keep each of these heifers until calving time.

Extra Good vs. Average Rearing of Heifers.

Project No. 5.—So that breeding would not influence results, twins were chosen for this experiment. One of them was fed as she probably would have been on the average farmer's place, whilst the other was kept fat all the time. It will, of course, take a few years before conclusions can be arrived at, and other heifers will have to go through the same experiment. But as far as weight is concerned, it can be said that, at 34 months of age, it was about the same for each, the one which had been kept thin having picked up considerably since both of them, after calving, were fed a full ration.

EXPERIMENTAL HOUSING.

Keeping cattle in single boarded sheds.

Project No 6.—Cows giving milk, and young calves, should be kept in moderately warm buildings, but all other cattle may be wintered outside with single boarded sheds as shelters. Since 1915, three bulls have been kept this way all the year around, and during the winter of 1918-19, two heifers had the same treatment, being only brought in a short while before calving. Every one of these animals has remained in the very best of health.

SELLING BREEDERS AT REASONABLE PRICES.

There are more French Canadian cows and heifers which have qualified for the Record of Performance, at the Cap Rouge Station, than in any other herd. The three bulls are out of dams which have this distinction, and calves from such stock, sold at reasonable prices, should certainly be a benefit to farmers of the district.

HORSES.

There are now 27 horses, including 22 registered French Canadians. They are kept for five purposes: work on the farm, experimental breeding, experimental feeding, experimental housing, and to distribute high class breeders.

Work on the Farm.

During the year, each horse averaged 1,920 hours of work, leaving aside, of course, the unbroken colts. As nine mares had foals, this is fairly good. With feed and manual labour at present prices, the cost of horse work, per hour, is now extremely high, unless farming operations are planned in such a way that animals are worked as many days as possible through the year. In general, nearly one-fourth of each farm is devoted to growing feed for horses.

EXPERIMENTAL BREEDING.

There are three investigations: close breeding, raising fall colts, work vs. no work for brood mares.

Close Breeding.

Project No. 7.—A mare and her son, dropped at the station, were used for this experiment. Though both are in perfect health, the three youngsters born from this mating died, one at about twelve months, another at twenty-one months, and the third at three months. It may be possible that the mare and the sire of her son were inbred themselves, which would be very close breeding for the colts dropped at the station, and this project will be continued with another mare and her son.

Raising Fall Colts.

Project No. 8.—If mares dropped their foals in the autumn, they would wean them in the spring and thus could do much more work during the cropping season. This is the main reason which prompted this experiment. Two fall colts were dropped and raised in box stalls, as there could be no question of wintering these youngsters outside. At first, probably on account of the close confinement in the stable, they did not seem to thrive well, but they got over this and have developed as well as the others. It must, however, be admitted that mares do not always come in heat in the autumn and that they are then harder to *settle* than in the spring.

Work vs. no work for brood mares.

Project No. 9.—The same mare was bred four years running and was subjected to different ways of exercising. Two winters, she was worked reasonably all the time until foaling; another, she was turned outside with only a single boarded shed for a shelter; and the next she was kept in a box-stall, without work, but turned out often for exercise. As she raised a fine filly each year, it shows that if exercise is essential for the brood mare, the mode of exercising is not of importance, as long as judgment is used.

EXPERIMENTAL FEEDING.

The two experiments relate to the quantity of feed necessary to rear a young animal until he is ready to earn his living, and to the quantity of feed required during a year by a work horse.

Feed Required to Raise Horses.

Project No. 10.—All feed given to a colt and to four fillies was weighed until they were broken to harness, when their age averaged 34 months and 9 days, their weight, 1,296 pounds, and their feeds, 17 pounds whole milk, 621 pounds skim milk, 17 pounds wheat, 3 pounds oil meal, 11,403 pounds hay, 3,672 pounds oats, 4,203 pounds bran, besides six months on a poor pasture. Calculating the above feeds at the following prices: whole milk $2, skim milk 25 cents, wheat $3, oil meal $3, oats $2.75, bran $2 per 100 pounds, hay $15 per ton, pasture $2 per head per month, it cost over $225.00 for each of them for feed alone. When service fee, loss of time by the dam, barn or shed room, bedding, care, and risks of accidents or deaths are added to the above, it is clear that only good horses should be raised if they are to be profitable.

Feed requirements of work horses.

Project No. 11.—All the feed of two working horses was weighed during a year and it was found out that it cost $206.93 for each of them, whose average weight was 1,214 pounds, calculating hay at $15 per ton, oats at 2¾ cents, bran at 2 cents, and molasses at 4 cents per pound. As horses do not, on the average farm, work more than five hours during 300 days, per year, the cost is very high per hour per horse, just for feed, besides interest, depreciation, risks of accidents and death, veterinary services, barn room, bedding, care, harness, blankets, halters, etc. One of the best ways to have cheaper horse labour is to use only strong, healthy animals and so to plan the work that they are employed the greatest number of hours possible, through the year.

EXPERIMENTAL HOUSING.

Raising horses in single boarded sheds.

Project No. 12.—All colts are raised in single-boarded sheds at Cap Rouge. They leave the barn, with their dam, when a few days old and only go back when they are broken and worked on the Farm. The doors on the sheds are open all the year around, day and night, except perhaps half a dozen times during heavy sleet, in winter. Though nineteen different young horses were wintered thus, and the temperature went down as low as 34° F. below zero, never was one seen to shiver. They keep in the pink of health, often commence to shed their hair earlier than those kept inside, and have strong, clean limbs, due to exercise. Theoretically, it should take more feed to keep up the warmth of their bodies, but it is a question if this is so, because all that is eaten is digested and assimilated, whilst in a badly ventilated stable, digestion is certainly not so good.

SELLING BREEDERS AT REASONABLE PRICES.

The stud of French Canadian horses at Cap Rouge is admitted by everybody to be the best in existence to-day. Farmers are taking advantage of the reasonable prices at which colts are sold and these generally go as weanlings. In 1918, three were shipped to Ontario and one to Nova Scotia.

SHEEP.

On March 31, 1919, the flock comprised three stud rams, twenty-eight breeding ewes, six shearling ewes, and twenty-six lambs, a total of sixty-three, all pure-bred Leicesters. They are kept for experimental feeding, experimental housing, and to sell breeders at reasonable prices.

EXPERIMENTAL FEEDING.

Feed required to winter breeding ewes.

Project No. 13.—This investigation is to find out how much feed it takes to winter a breeding ewe, as this is, no doubt, one of the main items in the cost of production of lambs. Calculating hay at $15 per ton, pea straw at $5, swedes at $4, oats at 2¾ cents per pound and bran at 2 cents, it has cost, on an average, $12.64 to carry a breeding ewe during two hundred days, from the beginning of November to about the middle of May.

EXPERIMENTAL HOUSING.

Raising lambs in single boarded sheds.

Project No. 14.—The ewes are wintered in single-boarded sheds, with an open front facing south. When they are due early, they are brought down to the sheep barn a few days before lambing, but as soon as the youngsters are about a week old, a day or so after they have been docked and ear marked, they are sent back to the shed

with their dams. Only one lamb, and he was a triplet, out of 33, was lost in 1919, so that this treatment cannot be very hard on them. Pure air, though cold, is much better than warm air when vitiated.

Selling Breeders at Reasonable Prices.

A strong-constitutioned flock is kept at Cap Rouge and two of the rams used were bred at the Station from a strain of prolific, heavy milking ewes, two quite important points in the raising of good sheep. Farmers of the district take advantage of the reasonable prices and there has never been any trouble to dispose of the rams, over $500 worth being sold during 1918 for breeding purposes.

POULTRY.

Barred Rocks exclusively are kept for experimental breeding, experimental feeding, experimental housing, and to distribute good stock. Experimental work is also done in regards to the best means of preserving eggs. Though about three hundred hens and pullets were wintered in 1918-19, a great number were sold after the incubation season, so that the average number kept during all the year was 187. They laid 14,803 eggs or about 80 per hen.

Experimental Breeding.

This consisted in comparing the profitableness of layers of different ages.

Layers of Different Ages.

Project No. 84.—Four pens of about twenty-five birds each were used during the months of November, December, January, February, four years in succession. If the cost of production of one dozen of egg is taken as 100 for early pullets, hatched before May, then it would be represented by 290 for late pullets, hatched after April, by 356 for yearling hens and by 1,452 for old hens. The cost was about 30 cents per dozen for early pullets, $1.13 for late pullets, $1.38 for yearling hens, and $5.65 for old hens.

Experimental Feeding.

There are four experiments to compare different kinds of feeds and watering: skim milk vs beef scraps, commercial grain vs screenings, roots vs clover leaves, water vs snow.

Skim Milk vs. Beef Scraps.

Project No. 81.—This experiment was made during November, December, January and February, three years in succession. Twenty pullets were in each pen and both lots were fed alike with the exception that one received skim milk and the other beef scraps. The birds receiving skim milk laid much better and took on a little more weight than those getting beef scraps. If the profit from the first lot is taken as 100, that from the second would be only 9. As 12.66 pounds of skim milk were fed for each pound of beef scraps, then 100 pounds of the latter were only equivalent to 114 pounds of the former.

Commercial Grain vs. Screenings.

Project No. 79.—This experiment ran three years, during November, December, January and February. An average of twenty-four birds were in each pen and were fed alike, of roots, animal food, meal, grit, shells, but one lot received commercial grain and the other screenings. When these screenings were such as would be taken from the fanning mill by a farmer who thoroughly cleans his grain for seed, they were

worth about ¾ of commercial grain, but when they were elevator screenings from the West, containing a lot of wild buckwheat and other seeds, it took about eleven pounds to give as good results as one pound of commercial grain. This experiment will be continued during two more years and it is advisable to wait further results before forming a decided opinion on the subject.

Roots vs. Clover.

Project No. 80.—This experiment has been running three years, during November, December, January and February. An average of about twenty-two birds were in each pen and both lots were fed alike with the exception that one received swede turnips and the other dry clover leaves. The birds receiving dry clover leaves laid better and took on more weight than those getting swede turnips. If the profit from the former is taken as 100, that from the latter lot would be only 38. As 2·03 pounds of swede turnips were fed for each pound of dry leaves, then 100 pounds of the latter were equal to 534 pounds of the former.

Water vs. Snow.

Project No. 82.—For three years, this experiment was conducted during November, December, January and February. An average of about twenty-one birds were in each pen. Both lots were fed practically the same, with the exception that one received water whilst the other got snow as soon as it came and then all winter. The cost per dozen of eggs was not greater for the birds receiving snow, but this lot did not gain as much weight as the other. The conclusion, to date, is that water is better, but not so much so that a farmer who cannot, or does not want to give it, should not keep poultry.

EXPERIMENTAL HOUSING.

Project No. 83.—The highest and lowest temperature were taken each day, during the months of November, December, January and February, for four years, outside, in a colony 8 feet wide, in a laying house 12 feet wide, and in another 16 feet wide. All styles of buildings were of the ordinary shed roof pattern, had twice the area of cotton as of glass, and were placed so as to get about the same amount of sun and wind. The range of temperature, that is the difference between the highest and the lowest, during all that time, averaged 37·5 degrees outside, 26·6 in the colony, 25·4 in the narrow house, and 24·0 in the wide one.

DISTRIBUTING GOOD STOCK.

Over 2,000 eggs, and fifteen birds, were given to other Stations and to members of survey work. Besides this, eggs, chicks and breeding stock were sold at prices current in the district. In every case, the very best only is sent out, the rest being disposed of for consumption.

EGG PRESERVATIVES.

Project No. 78.—For three years, different methods of keeping eggs were tried, such as wrapping in paper and leaving alone, wrapping in paper and turning daily, putting away in oats, in sawdust, in lime water, in water-glass. Samples were tested at the Chemistry Division, Central Experimental Farm, Ottawa, and at the Cap Rouge Station. Only lime water and water-glass have given satisfaction. That eggs can thus be well preserved is shown by what the Dominion Chemist wrote about eggs preserved in June, 1918 and tested in February or March 1919: "It may be said in conclusion that these eggs were as fine as any preserved eggs we have examined."

BEES.

The bees, at Cap Rouge, are hybrids between Blacks and Italians. They are kept for commercial and experimental work.

Production of Honey.

In 1918, twelve colonies averaged 68 pounds of honey which sold for $13.65, the greatest yield from one being 184 pounds. Deducting the sugar fed, each colony netted $13.21. It is thought that 86 per cent of the above honey was from white and alsike clover, whilst 14 per cent came from weed flowers.

Experimental Work.

Comparison of different stores for wintering.

Project No. 16.—Some colonies are fed early-gathered honey, others late-gathered honey, others early-gathered honey and sugar syrup, and others only sugar syrup. The average, to-date, shows that those fed early-gathered honey lost 17 pounds in weight during the winter, those fed late-gathered honey lost 22 pounds, those fed early-gathered honey and sugar syrup lost 18 pounds, and those fed only sugar syrup lost 11 pounds. As to the condition of the bees, in the spring, there was not much difference, but it is certainly better to wait the results of a few more winters before coming to conclusions.

FIELD HUSBANDRY.

Work for this division comprises crop management, soil management, and agricultural engineering.

Crop Management.

Under this come crop yields, cost of production of field crops, rotations, and experimental work.

Crop Yields.

Project No. 36.—They were generally lower than usual, with the exception of hay, both in the district and at the station. At the latter place, grain was better than the average elsewhere, because most of the land is tile drained.

Crop.	Yield per Acre in Pounds. 1918.	Average.	For—
Longfellow corn	9,452	16,175	7 years.
Good Luck Swedes	15,189	27,886	7 "
Timothy hay	5,502	3,489	7 "
Clover hay	4,609	4,124	7 "
Banner oats	1,695	1,584	7 "
Manchurian barley	1,237	1,127	5 "
Huron wheat	1,621	1,694	4 "
Arthur peas	1,765	1,542	4 "

Cost of Production of Field Crops.

Project No. 35.—Since 1913 inclusive, accurate records have been kept on eighty-eight acres, for the three main crops of the district, swede turnips, oats, and hay, with the following results:—

	1918. Yield per Acre. Lbs.	Cost.	Average for Six Years. Yield per Acre. Lbs.	Cost.
Good Luck Swedes	15,189	$5 78 per ton.	27,146	$3 13 per ton.
Banner oats	1,654	0 55 per bushel.	1,890	0 37 per bushel.
Timothy and clover hay	4,152	6 64 per ton.	4,575	5 89 per ton.

It is interesting to note how an increase in yield lowers the cost per acre, and vice versa.

Rotations.

Project No. 43.—A three, a four, and a six-year rotation have now been compared for eight years. Each has a hoed crop, followed by oats and then by hay for one, two or four years. Contrary to expectations, the long rotation has given more profit per acre, per year, than the short one which was a little ahead of the four-year.

Experimental Work.

This consisted in comparing different rates of seeding oats, also of seeding timothy, red clover and alsike, in recording the yield of hay when the nurse crop had been sown at different rates, also the yield of hay after different kinds of grain.

Rates of seeding oats.

Project No. 38.—Thirteen different rates, going up by a quarter of a bushel from 1 to 4 inclusive, were tried during five years, from 1913 to 1917 inclusive. In 1918, the six rates which had averaged the highest were on test with the following results, the amount of seed being deducted in each case from the total yield, leaving the net yield: 1¾ bushel of seed gave 57 bushels and 27 pounds; 2½ bushels, 60 bushels 16 pounds; 2¾ bushels, 58 bushels 14 pounds; 3 bushels, 58 bushels 20 pounds; 3¼ bushels, 59 bushels 10 pounds; 3¾ bushels, 63 bushels 27 pounds. This was on a sandy loam of better than average fertility.

Rate of seeding timothy, red clover and alsike.

Project No. 39.—Since 1912 inclusive, 138 plots of one-sixtieth acre each were used for this experiment, on half of which 12 pounds timothy, 8 pounds red clover and 2 pounds alsike were sown per acre, with Banner oats as a nurse crop, whilst the others only received half of these quantities. The thick seeding gave 151 pounds more hay per acre, or only an increase of 4 per cent which shows that on a sandy loam of better than average fertility, kept in good tilth by a 3-year rotation, it is not as necessary to sow large quantities of grass and clover seed as it would be on a poor soil badly worked.

Yield of Clover Hay with different rates of sowing oats.

Project No. 41.—For six years, Banner oats were sown at thirteen different rates from 1 to 4 bushels per acre and the hay weighed the next season from each plot. If the average is taken as 100, then the crop of hay following the usual rate of 2½ bushels of oats per acre would be represented by 89, whilst that following all rates below 2½ bushels would be represented by 100 and that following all rates above 2½ bushels would be represented by 116.

Yield of Clover hay with different kinds of nurse crops.

Project No. 40.—Since 1912, all the trial plots, 310 in number, were seeded down to timothy and clover. If the crop of hay after barley is taken as 100, that after wheat would be represented by 95, after oats by 88, and after peas by 64.

Soil Management.

The only experiment going on is to find out if it is better to plough in the autumn or in the spring, for the production of ensilage corn, both as regards to cost of growing the crop and as to tonnage.

Fall vs. spring ploughing for silage corn.

Project No. 42.—The average of two years shows that the actual cost of growing one ton of silage corn is greater when the ploughing is done in the spring. This is due mostly to the difference in yield, as if 100 is taken for the crop from the spring ploughed area, the one from the fall ploughed ground would be represented by 111. It should be noted that this is no small plot work, as all the corn grown on 17·98 acres was weighed.

AGRICULTURAL ENGINEERING.

On account of the scarcity of funds and of manual labour, not much could be done during 1918 at clearing land, draining, fencing and road making. However, nothing suffered and the most pressing needs were attended to.

CEREALS.

The work with cereals includes tests of varieties, the isolation of good strains, the growing of grain for hay, the comparison of different mixtures for grain, and an experiment in regard to what influences the cooking qualities of field peas.

VARIETY TESTS.

Thirty-three varieties of barley, flax, oats, peas and wheat were tried in 1918, all in duplicate, which necessitated sixty-six plots of one-sixtieth acre each.

Barley.

Project No. 23.—Since 1911, sixteen varieties or strains of two- and six-rowed barley were tried and nine of them were dropped because they did not yield enough. Manchurian seems the best adapted to this district. Its average production, for seven years, is 1,289 pounds of grain per acre, and it took 87 days to come to maturity.

Flax.

Project No. 25.—Two varieties, Longstem and Novelty, have been tested since 1915. The first one, which is more adapted to the production of fibre, averaged 560 pounds of grain per acre and took 107 days to mature, whilst the second averaged 768 pounds of grain per acre and took 111 days to mature.

Oats.

Project No. 26.—Thirteen varieties of oats have been tried for eight years and six of them have been left aside because they were low yielders. Banner is recommended as meeting very well the conditions of this part of Quebec. Its average production, for seven years, is 2,196 pounds of grain per acre and it took 104 days to come to maturity.

Peas.

Project No. 24.—Since 1911, twelve varieties or strains of field peas have been tried and seven of them were dropped because they did not yield enough. Arthur is the one which has shown the most consistency as a high producer, giving, for an average of seven years, 2,160 pounds of grain per acre and maturing in 98 days.

Wheat.

Project No. 27.—Twenty varieties or strains of spring wheat have been tried for eight years and ten of them were left aside because they were low yielders. Huron has done the best of all those which have been on test for a reasonable time. Its average production, for eight years, is 1,353 pounds of grain and it took 101 days to mature.

Isolation of Good Strains.

Selections of barley, oats, and wheat have been made for six years, with good results.

Manchurian Barley.

Project No. 19.—In 1914, a certain number of heads were chosen in the field crop and the grain from each was weighed. In 1915, the thirty best strains were kept, in 1916, the ten best, in 1917, the best, and in 1918 this strain was sown in the test plots, where it was the highest yielder, with Manchurian from Ottawa, but three days earlier than the latter.

Banner Oats.

Project No. 21.—In 1917, a number of heads were chosen in the field crop and in 1918 the same number of kernels from the ninety best were sown in as many different rows, with a check at both ends and at each fifth row. There was a difference of 67 per cent between the lowest and the highest yielding rows, and of 8 per cent between the general average and that of the best ten rows, grain from which will be sown in 1919.

Huron Wheat.

Project No. 22.—A number of heads were selected in 1913 from the field crop, where they did not seem to have had any special advantage in regards to soil or room. Since then, the best yielders were gradually cut down in number until one remained at the end of the season of 1917. In 1918, it was sown on duplicate plots, in the variety tests, where it was at the top, giving 36 per cent more grain than the other strain of Huron did in 1918, and 17 per cent more than the latter did for an average of eight years.

Growing Grain for Hay.

Project No. 17.—The average of four years shows that when mixed hay from old meadows produced 4,797 pounds per acre, timothy 4,476, clover 4,884, hay from Banner oats gave 5,910, from Ligowo oats 6,495, from Gold Rain oats 7,335, from Victory oats 7,605, from Banner oats and Arthur peas 5,865, from Banner oats and vetches 6,705 pounds. Oats alone, of varieties yielding much hay, such as Victory and Gold Rain, give the largest quantity of digestible dry matter per acre, but vetches and oats, closely followed by the old mixture of peas and oats, furnish the most protein, which makes it fine hay to feed to dairy cattle, sheep and all young stock.

Mixtures for Grain Production.

Project No. 18.—In general, mixtures have not yielded as much per acre as the different grains sown alone. Out of thirteen different mixtures, eight have been discarded for the above reason, and work is continued with five, i.e., Banner oats and Premost flax, Banner oats and Duckbill barley, Banner oats and Arthur peas, Banner oats and Huron wheat, Banner oats, Duckbill barley and Huron wheat.

Cooking Qualities of Field Peas.

Project No. 34.—Arthur peas were used for this experiment in 1917 when it was found out that, as an average, it took as long to cook peas whether they were grown on heavy or on light soil. The results of two years, however, show that if the time to cook peas grown after grain is 100, it would be represented by 162 for peas grown after a hoed crop, and by 231 for peas grown after grass. This experiment will be conducted a few years longer to gather more conclusive data.

FORAGE CROPS.

Investigations with forage crops consist in the testing of varieties, the selection of good strains, seed growing, and a comparison of different methods of helping the germination of mangel seed

Variety Tests.

Nine varieties of carrots, mangels and swede turnips were tried in 1918, all in duplicate, on one-hundredth acre plots.

Carrots.

Project No. 45.—Since 1911, fourteen varieties of carrots have been tried and the Mammoth White Intermediate is at the head with an average yield, for seven years, of 16,231 pounds per acre.

Mangels.

Project No. 46.—Twenty varieties of mangels were tested since eight years with the result that Giant Half Sugar White was the heaviest yielder, giving 15,816 pounds for an average of six seasons.

Swede Turnips.

Project No. 53.—Since 1911, thirty-five varieties and strains of swede turnips have been tried, and Good Luck is easily the best of them all, with an average of 36,969 pounds per acre for eight years.

Isolation of Good Strains.

Selections of alfalfa, corn, and swede turnips have been made for a few years.

Alfalfa.

Project No. 57.—A certain quantity of Grimm alfalfa was sown with the object of getting the hardier strains through natural selection, the others being winter-killed. A fairly well protected spot was chosen at first, where snow generally remains from early winter until late spring, but seed gathered from this patch will be sown on another area where very little snow stays, as this seed will come from plants which are being gradually acclimatized.

Corn.

Project No. 61.—A few years ago, good seed of Quebec Yellow was procured and fifty rows were sown with kernels from as many ears. After a careful examination through the growing season, it was decided to keep ears from sixteen rows and this number was cut down to five the following year. Out of these, four were the heaviest yielders and the other was the earliest. Grain from one of the heavy yielders was sown in rows alternating with others sown with the earliest, so that natural crosses might take place in the field. This strain has now been sent, per request, to the western provinces and even to England.

Swede Turnips.

Project No. 58.—After finding out from the trial plots that Good Luck was the heaviest yielder, roots of different varieties tried here were sent to the Division of Chemistry, Ottawa, and it was also ascertained that this variety produced the largest quantity of dry matter per acre. Since then, roots containing the most dry matter, easily found by immersing in brine, are used as seed bearers to increase the dry matter content of this variety. Soon, individual roots of special merit will be used to grow seed under small tents, to prevent crossing, so as to isolate the very best.

SEED GROWING.

A certain quantity of Quebec Yellow corn and of Good Luck swede seed is grown each year for distribution to farmers of the district who can thus start with very good strains well acclimatized to this part of Quebec.

HELPING THE GERMINATION OF MANGEL SEED.

Project No. 55.—The results of nine different tests made in flats in the greenhouse show that if the check is taken at 100, packing the soil would give a germination of 99; watering each day, of 97; packing the soil and watering, of 99; applying a complete fertilizer in the row with the seed, of 48; mixing a complete fertilizer with the soil as in harrowing, of 85; applying salt in the row with the seed, of 12; mixing salt with the soil as in harrowing, of 47; soaking seed in water for 15 hours, of 104; soaking seed in a mixture of liquid manure and water for 15 hours, of 103. As will be seen, soaking seems to be the only means of improving the germination of mangel seed, and it has very little influence.

FLAX.

Project No. 88.—For three years, an acre of flax has been grown for fibre and the straw sent to Ottawa where it is examined and worked to see if the district is suitable for this crop. The average yield of straw has been 3,737 pounds per acre.

FERTILIZERS.

Work on four projects was completed in 1918.

Comparative Value of Different Forms of Nitrogen.

Project No. 31.—The object of the experiment was to compare nitrate of soda with sulphate of ammonia as a source of nitrogen, when the elements phosphorus and potassium are in sufficient quantity. A three-year rotation of potatoes, oats and clover was followed. The result was that if 100 is taken as the crop obtained from sulphate of ammonia, then the crops obtained with the use of nitrate of soda would be represented by 136 for potatoes, 101 for oats, whilst the quantity of clover hay was practically equal in both cases.

Comparative Value of Different Forms of Phosphorus.

Project No. 32.—The object of the experiment was to compare superphosphate, basic slag and bone meal as sources of phosphorus, when the elements nitrogen and potassium are in sufficient quantity. A three-year rotation of potatoes, oats and clover was followed. The result was that if 100 is taken as the crop obtained from superphosphate, then the crops obtained with the use of basic slag and with the use of bone meal would be respectively represented by 56 and 47 for potatoes, 100 and 113 for oats, 110 and 115 for clover hay.

Value of Ground Seaweed as a Fertilizer.

Project No. 33.—The object of the experiment was to find out the value of ground seaweed as a fertilizer, especially as a source of potassium. A three year rotation of potatoes, oats and clover was followed. An application of 31·5 pounds of phosphorus and 22·5 pounds of nitrogen per acre, or of 31·5 pounds phosphorus and 40 pounds potassium, or of 31·5 pounds phosphorus, 22·5 nitrogen and 40 pounds potassium all gave much better crops than an application of 1,500 pounds ground seaweed. As a source of potassium, if 100 is taken as the crop obtained by 1,500 pounds of ground seaweed, then the crops obtained with the use of 100 pounds of muriate of potash would be represented by 128 for potatoes, by 90 for oats, and by 124 for clover hay.

Comparative Value of Burned Lime and Ground Limestone.

Project No. 28.—The object of the experiment was to compare the value of burned lime with that of ground limestone on a clayey loam of better than average fertility. The rotation followed was oats, clover and timothy. The result was that if 100 is taken as the crop obtained with the use of ground limestone, then the crops obtained with the use of burned lime would be represented by 102 for oats, 113 for oat straw, 106 for clover hay, 116 for timothy hay, about the same quantities of oxide of calcium being applied in both cases. When fifteen tons of manure was added to both, and if 100 is taken as the crop obtained with the use of ground limestone, then the crops obtained with the use of burned lime would be represented by 120 for oats, 91 for oat straw, 107 for clover hay, and 95 for timothy hay.

HORTICULTURE.

The investigations in this division relate to fruits, ornamental plants, and vegetables.

Fruits.

Work with fruits consists in the testing of varieties, the selection of good strains, and cultural experiments.

Variety Tests.

There are now on test the following number of varieties: apples, 148; cherries, 16; pears, 4; plums, 37; black currants, 14; red currants, 11; white currants, 3; gooseberries, 11; raspberries, 10; strawberries, 26; grapes, 29, or a total of 309.

Apples.

Project No. 87.—Of the 148 varieties of apples on test, none has been planted before 1911, but the ones which seem the best adapted to this part of Quebec are Yellow Transparent, Lowland Raspberry, Red Astrachan for summer; Duchess, Montreal Peach for autumn; Wealthy, Milwaukee, Wolf River, Fameuse, McIntosh Red, McMahon White for winter. Rupert for Summer, Petrel for autumn, Walton for winter are three splendid ones introduced by the Central Experimental Farm, Ottawa, but not yet for sale by nurserymen.

Cherries.

Project No. 86.—None of the sweet cherries is hardy enough for central Quebec. Of the sixteen varieties tested, the ones which seem to be best adapted here are Early Richmond, Montmorency Large, Orel No. 25, Griotte Morello, Vladimir.

Pears.

Project No. 93.—It is probable that no variety of pears will be a success so far north, and only one fruit was produced here, though some of the trees have been planted since 1913. Clapp Favorite and Flemish Beauty are the two most promising.

Plums.

Project No. 76.—Contrary to expectations, a larger percentage of the European varieties have lived at Cap Rouge than of the American varieties, whose wood breaks very easily. Of the first kind, the best seem to be Bonne Sainte Anne, Shipper Pride, Quackenboss, Montmorency, Raynes, whilst Bixby, Mankato and Cheney are the leaders amongst the latter.

Black Currants.

Project No. 68.—Of the fourteen varieties of black currants on test for seven years, Climax leads with an average yield of 8,362 pounds per acre, followed by Saunders with 6,556 pounds. Both these varieties were originated at the Central Experimental Farm, Ottawa. Of the ones in the trade, Boskoop Giant showed up well, with 5,261 pounds per acre.

Red Currants.

Project No. 69.—Eleven varieties of red currants have been on test since 1912. The two highest yielders are Fay Prolific with an average production of 8,470 pounds per acre, and Perfection with 7,287 pounds.

White Currants.

Project No. 70.—White currants have given much smaller crops than either the blacks or the reds, at Cap Rouge, though planted alongside of the others at the same time. White Grape is the best of the three varieties tried here for seven years and has averaged 4,085 pounds per acre.

Gooseberries.

Project No. 71.—Eleven varieties of gooseberries have been tested since 1912 and the highest yielder is Houghton, with an average production of 17,065 pounds per acre, but the fruit is too small. The one which is the most promising is Silvia, originated at the Central Experimental Farm, Ottawa, which yielded at an average rate of 13,103 pounds per acre.

Raspberries.

Project No. 72.—Out of ten varieties tested, Herbert is the highest yielder, with an average production per acre, during seven years, of 2,113 pounds. King was the earliest, but gave only 1,971 pounds per acre.

Strawberries.

Project No. 73.—Though a plantation was started in 1911, the variety tests were in uniform shape only in 1915, so that results have been tabulated for four years. The heaviest yielder is a seedling from the Central Experimental Farm, Ottawa, called Cassandra, which averaged 9,333 pounds per acre. The variety in the trade that, at present, seems the most worthy is Dunlap, which produced at the rate of 7,530 pounds per acre, whilst Excelsior was the earliest, and gave 5,646 pounds per acre.

Grapes.

Project No. 122.—Twenty-nine varieties of grapes are on test, but very few of them will be early enough for central Quebec. The ones which are the most promising are: Blacks, Champion, Early Daisy; reds, Wyoming, Delaware; whites, Green Mountain.

Selection of Good Strains.

Besides many seedlings of apples, plums, black, red, white currants, gooseberries, raspberries, strawberries, there are a great number of grafted stock from scions of apple trees known as early or heavy bearers, also bushes, canes, plants, and vines from individual currants, gooseberries, raspberries, strawberries and grapes which have shown superiority in some way or other. No strain is selected except from a variety which stands well at the top of its class in the trial plots, in regards to certain characters such as yield, hardiness, earliness, or quality.

Cultural Experiments.

There are two projects: The comparison of different cover crops for an apple orchard and the comparison of different methods of planting strawberries, but they have not been under way long enough to warrant publishing results. In the first one are compared red clover, vetches, rape, each of them sown every year, rape followed by clover in a two-year rotation, permanent sod with hay cut and placed around the trees as a mulch, also permanent sod, with hay taken away. In the second, the matted row is compared with plants set every foot in the row.

Ornamental Plants.

A total of 665 varieties of ornamental plants, including 292 annuals, 190 perennials, 183 shrubs and trees were on test during 1918. Besides beautifying the grounds of the Station, these are used to find the ones which are best suited to the conditions of Central Quebec, and some of them to produce seeds and plants for distribution. Work has been started, on a small scale, to try and produce special strains of the flowering plants which are well known to farmers, and a seedling geranium is now propagated which is certainly much above the average.

Vegetables.

The main lines of work with vegetables relate to the testing of varieties, the isolation of valuable strains, cultural experiments, and seed growing.

Variety Tests.

Though variety tests were somewhat cut down in 1918, still there were ninety different kinds of beans, beet, cabbage, carrots, corn, onions, peas, potatoes and tomatoes in the trial plots. Generally, a variety is tried at least five years before being discarded, unless it is plain that it will not be adapted to the district.

Isolation of Valuable Strains.

Work was continued during 1918 in isolating good strains of some of the varieties of vegetables which have shown, by their earliness, yield or quality, that they are profitable to grow in this district. An important point which must not be overlooked is resistance to disease, and, unfortunately, this does not always go with the above-mentioned qualifications. Within a couple of years some of these strains, which have been selected from four to eight seasons, will be named and possibly offered to the trade.

Cultural Experiments.

There are twenty-one different cultural experiments with vegetables. They relate to thinning distances for beets, carrots, parsnips, turnips; protection against maggots for cabbage and cauliflower; methods of blanching for celery, of forcing for rhubarb.

of training, staking and artificially ripening for tomatoes; comparing sets with plants and open ground seeding for onions; number of eyes, also plastering, for potatoes; comparing varieties of different precocity with one sown at different times for beans and peas. As soon as there are results of five years' experimenting they will be published.

Seed growing.

Seed has been grown at Cap Rouge of practically all kinds of vegetables raised in central Quebec, with the exception of cauliflower. In 1918, there were larger quantities than usual of cabbage, lettuce, radish, peas, salsify, sweet corn, and preparations were made for growing seed of beets, carrots, parsnips, celery, onions in 1919.

EXTENSION AND PUBLICITY.

The work for this division consists in having exhibits at fairs and in distributing literature.

Exhibitions.

Exhibits were made at Three Rivers, Quebec, Lotbinière, and at the Provincial Seed Fair. Over 15,000 persons saw the Cap Rouge products and three diplomas were awarded. It was noted that the greatest number of inquiries were about horticulture, poultry, cereals, dairying and bees, in the order named.

Publicity.

At the above fairs, a large number of circulars were distributed to interested parties, no attempt being made to force publications on people who would probably throw them away as soon as out of sight of the attendants. Quite a number of bulletins were sent out to farmers who wrote inquiring about certain matters and also to each person to whom a free distribution of seeds, plants or trees was made.

DISTRIBUTIONS.

Seventy packets of tomato seed, 26 of cabbage, 7 of swede, 36 of flower, 124 samples of potatoes, 47 of field beans, 5 of garden beans, 2 of field corn, 10 of sweet corn, 9 of garden peas, besides 3,200 strawberry plants, 744 raspberry canes, 141 black currant, 48 red currant, 135 white currant, 117 gooseberry bushes, 834 apple trees, and 216 perennial plants, all grown at Cap Rouge, were distributed during the fiscal year 1918-19.

VISITORS.

Besides a great number who come on Sundays and holidays, in summer, there were 4,030 visitors at the Station during 1918. It is probable that not one per cent can say that all the attention possible has not been given to them, even to spending hours with a single man to give him information on one subject.

CORRESPONDENCE.

During the twelve months, 4,488 letters were received and 5,023 were sent, besides a large number of circulars concerning the free distribution.

BUILDINGS.

The calf barn was completed. With the open shed adjoining it, for yearlings, also the feed room, and the root cellar, it is one of the most up-to-date buildings of its kind in the province of Quebec to-day.

EXPERIMENTAL STATION, LENNOXVILLE, QUE.

REPORT OF THE SUPERINTENDENT, J. A. McCLARY.

THE SEASON.

The ice cleared out of the St. Francis river on April 2, 1918, overflowing the public road and blocking traffic for two days.

The weather throughout the month of April was fair and cool with very little precipitation. The first ploughing was done on the 15th and the first seeding on the 30th.

The month of May was fine and warm, which enabled the farmers to get their crops in early and in good condition, and practically all crops were sown in that month, with the exception of swedes and beans. We were very unfortunate in having frost on the 19th, 20th and 21st of June, which did considerable damage to corn, potatoes, vegetables and beans.

The weather the first half of July was very dull and wet, rain falling on ten out of fifteen days. This excessive amount of rain did much damage to the corn crop by holding up cultivation and retarding growth, also preventing farmers from doing anything at their hay harvest up to the time when the weather cleared and gave them an opportunity to save their hay crop in the best of condition.

The weather during the month of August was very favourable for the ripening and harvesting of the early-sown grains which gave a good yield, but the frost we had in this district on the 18th and 19th, did much damage to the corn and other crops.

There was an excessive amount of rain in the month of September amounting to the 4th of September was practically a loss. On the 11th we experienced 9 degrees of 8·55 inches, which fell on 21 days. Much of the grain that was not harvested before frost which practically ruined the corn which was not harvested.

The month of October was also very wet with 6·19 inches of rainfall. The wet weather did much in holding back fall ploughing and other work that should have been done this month. The first snow fell on November 14 and ploughing had to be discontinued on the 27th on account of frosts.

December was much milder than usual, the first sleighs being used in this district on the 4th. The St. Francis river, which runs through the farm, was not frozen over at the end of this month, where in 1917 it was frozen on the 26th of November.

January was very mild and fine with very little snow. The month of February was also very mild. There was not the usual amount of snow during the winter, although sufficient for farmers to get their team work well along.

The weather throughout the month of March was very mild with practically all snow gone by the 15th.

The sugar makers in this district tapped their maple trees around the 15th with a very good yield for the month.

The ice cleared out of the St. Francis river, without any damage being caused, on March 28, 1919, five days earlier than in 1918.

METEOROLOGICAL RECORDS, 1918-19.

Month.	Temperatures.					Precipitation.			Total Sunshine.
	Maximum.		Minimum.		Mean.	Rainfall.	Snowfall.	Total.	
1918.	Date.	°	Date.	°	°	Inches.	Inches.	Inches.	Hours.
April	28	74	20	15	39·93	1·21		1·21	195·5
May	18	87	10	27	55·87	2·32		2·32	200·5
June	1	83	19	31	55·63	4·41		4·41	193·3
July	22	90	3	38	65·85	2·62		2·62	208·5
August	23	88	18	30	62·27	2·39		2·39	230·5
September	22	50	11	23	51·85	8·55		8·55	103·2
October	28	71	8	21	45·54	6·19		6·19	107·4
November	19	48	28	9	32·46	3·30	3·50	3·65	58·9
December	23	48	31	−18	20·75	0·94	19·50	2·89	34·6
1919.									
January	2	43	12	−27	16·45	0·10	18·00	1·90	38·5
February	22	44	11	−20	15·66		12·30	1·23	101·7
March	26	60	13	1	27·56	0·77	14·50	2·22	122·6
Total						32·80	67·80	39·58	1,595·2

LIVE STOCK.

Horses.—There are at present at this Station, nineteen horses, consisting of four registered Clydesdale mares, one young Clydesdale stallion born July 21, 1917, which weighed on April 1st, 1,255 pounds, one registered Clydesdale filly foal, born August 3rd, 1918, one carriage horse and twelve grade Clydesdale work horses. The mares at this Station are bred to foal in the month of August, if possible, so as to have the use of them in spring when horse labour is so important on the farms. The foals are run with their dams until March 1st, when they are weaned and the mares got into condition for seeding. Outside of our brood mares, we winter all horses that are not needed for work in the winter months, by running them in a yard with shelter at night, and feed a ration consisting of 20 pounds hay, 28 pounds ensilage and 2 pounds bran per day.

Cattle.—The Ayrshire herd at this Station at the end of March comprises forty head, as follows: 16 cows, 6 two-year-old heifers, 3 yearling heifers, 7 six-month-old calves, 7 young calves and one stock bull.

The calves from Gardrum Bold Boy-47138 look very promising and we see no reason why heifers, from this excellently bred stock bull, from high milk-producing dams, should not make good later on. We have already passed five Ayrshire cows of this herd in the Record of Performance test with others finishing soon with a good margin to their credit. These cows are being bred to freshen, where possible, within 365 days, wishing to increase our females as fast as possible in order to get the number required for our herd. The bulls from this herd are sold to farmers in the district at a nominal price and with good care and attention should make excellent herd headers for the Ayrshire herds in this section.

Shorthorns.—There were purchased for this Station in the month of January, as a nucleus of a dual purpose Shorthorn herd, five females and one young bull, as there seems to be a strong feeling among breeders of the Eastern Townships, (which is noted above all other districts of the province as a beef district) to have a cow that will produce a calf that, when grown, will produce the best and most economical beef, and at the same time give a good fair revenue from her milk. We feel that with proper selection and attention much can be accomplished along this line of work with the Shorthorn breed of cattle.

Beef Steers.—There are at this Station at present seventy-nine beef steers that were purchased in the month of November in order to consume the hay and silage grown at this Station. These steers will be marketed the last of April. Twenty-five of these are three-year-olds and the balance two-year-olds. The figures of the cost of grain per pound of the different ages will be given when marketed.

Sheep.—The sheep at this Station comprise sixty-three head, viz., eleven registered Oxford ewes, five registered Oxford shearlings, two registered Oxford rams, thirty-four grade Oxford ewes, ten grade Oxford shearlings and one registered Shropshire ram. A grading experiment is being carried on at present with ten grade Oxford ewes crossing with a Shropshire ram, to ascertain the results of the wool clip and weight of marketable lambs from this cross compared with Oxfords.

The wool from this flock was graded and sold through the Sherbrooke County Wool Growers' and Sheep Breeders' Association in the month of June, grading as follows:

220	pounds	fine combing at 79 cents	$180 91
14	"	fine medium combing at 75 cents	10 50
26	"	fine medium clothing at 70 cents	18 20
145	"	medium combing at 73½ cents	106 57
27	"	rejects at 45 cents	12 15
			$328 33
		Less commission	4 20
			$324 13

There were also sold through this same organization thirty-four mutton lambs and fifteen mutton ewes. This local organization and other such organizations in different districts have done much in the Eastern Townships to help and encourage the farmers in raising more sheep by giving them the best opportunity possible to dispose of their wool and mutton at the highest prices available.

Swine.—There were furnished this Station from the Central Experimental Farm, Ottawa, in the month of June, six young registered Yorkshire sows and one boar as a starter in this important line of animal husbandry work, in order to have some stock for the new piggery, which was built in the months of November and December of this fiscal year.

POULTRY.

There is not much yet to report on poultry as there has been work done only this past year on the erection of a poultry administration building 22 by 26 feet, with concrete basement for incubator and egg rooms, the upper story to be used as office and living quarters of man in charge, also a feed room. There have also been built a permanent poultry house 16 by 30 feet, two colony houses and yards erected. There is installed in the incubator room, one Mammoth incubator with a capacity of 200 dozen eggs. This work is starting on the first of April with an experienced man in charge, who will rear as many chicks as possible this coming season and select from them the foundation stock for this work which is to be carried on here.

The breed that will be used for the work at this Station will be Barred Plymouth Rocks. These will be trap nested and records kept of each individual with the object of improving the laying qualities of this popular breed in this district.

It is expected to do some poultry survey work in this district amongst the farmers and poultry raisers.

An addition to the plant will be made during the following summer.

BEES.

There was a small start made in bees in the month of May with two colonies furnished this Station from the Experimental Farm at Ste. Anne de la Pocatière. These increased through the season so that there were five colonies put into winter quarters in the fall.

FIELD HUSBANDRY.

Rotations.—The rotation followed at this Station is the general four years' rotation consisting of hoed crops the first year such as roots, potatoes and corn. For roots, the land is ploughed after the hay is taken off, then summer fallowed and ploughed the following spring. For corn, the manure is spread on sod in winter, ploughed under in spring and disced until a good seed bed is made and then corn planted. Second year, sown to wheat, oats or barley, and seeded at the rate of 10 pounds clover, 2 pounds alfalfa and 10 pounds timothy per acre; third year, hay. There will be practically no timothy showing the first year. The first cut of clover is saved for hay and harvested the latter part of June. The second crop is used for seed, or if the season is not favourable for seed production, it is cut and put into the silo where it makes the most palatable and nutritious feed that we have for our live stock. All stock relish and thrive well upon it and the dairy cow will produce the maximum amount of milk with silage made from good clover in conjunction with other necessary feeds. Fourth year, clover and timothy hay.

Crop Yields.—The crop of hay harvested the past season was of the very best quality, having excellent weather to harvest same. The crop at this Station comprised 275 tons.

The cereals consisted of 75 acres of oats which yielded 48 bushels per acre, 22 acres of a mixture consisting of 4 parts oats, 2 parts two-rowed barley, 1 part wheat. The yield from this mixture was 45 bushels per acre of excellent heavy grain which makes the best of feed for live stock when ground, 3 acres of Red Fife wheat, yielding 20 bushels per acre, making a total of 100 acres in grain.

There were 30 acres planted to Indian corn for silage purposes. With frosts the middle of June and also on the 18th and 19th of August, this crop was practically a failure, having a very light yield and some of it being so badly frozen that it was not of any use.

Three acres were planted to potatoes of different varieties in order to procure seed for distribution in the twenty-four counties in the southeastern part of Quebec, which this farm is supposed to serve. The yield was 250 bushels per acre.

One acre of beans was planted which were a total failure on account of early frosts on the nights of the 18th and 19th of August.

FORAGE CROPS.

Roots.—Six varieties of swedes were tested, Good Luck giving the highest yield of 16 tons 1,802 pounds per acre, with the Invicta Bronze Top the lowest with 15 tons 1,188 pounds. The fall turnip giving the highest yield was the Golden White Globe, 15 tons 1,556 pounds.

Three varieties of mangels were tested, the Mammoth Yellow Intermediate giving the highest yield of 16 tons 626 pounds per acre and the Prize Mammoth Long Red the lowest with 11 tons 84 pounds.

Four varieties of sugar beets were under test, the Improved Valmorin A yielding 10 tons 1,910 pounds, with the Klein Wanzleben the lowest with 10 tons 255 pounds.

Three varieties of carrots were under test, the Improved Short White giving the highest yield of 10 tons 90 pounds, and the Danish Champion 6 tons 1,068 pounds.

Ten varieties of silage corn were planted, but no results were obtained on account of the frosts which ruined the same on the 18th and 19th of August.

HORTICULTURE.

During the season just past, extreme conditions were recorded which have hardly been known in former years to the settlers of this district, and which have to a very great degree acted as what may be termed a real test winter for the fit varieties, or such as in future years may prove of value for the district. This applies to fruit trees, cane and bush fruits, flowering shrubs and perennial flowers.

The very low temperatures recorded during the course of the winter of 1917-18 certainly were very hard on all varieties. The long cold spell which lasted from the time winter set in, early in November, until the spring opened, was without a thaw. It was noticed that many of the old, well-established trees had been severely damaged, not to mention the severe injury that had been done to the younger trees.

Throughout the summer conditions continued very backward and cold; frosts occurred the middle of June, with a very cool spell in July, followed by quite a severe frost about the middle of August, which did severe damage to all the tender crops. The weather was quite warm for a period lasting to the 10th of September, when a very severe frost cut off all crops entirely.

ORCHARDS.

Cultural Apple Orchard.

The amount of damage done to the orchard was not actually ascertained until well on into the season, because of the character of the injuries sustained by the trees. About 30 per cent of the 869 trees were damaged, of which 27 per cent will have to be replaced. In fact, it should be noted that many of the trees that survived are affected with black heart, which may result in considerable loss later on.

The varieties which suffered the most are as follows: Blue Permain, Bethel, Milwaukee, Fameuse, and McIntosh. But it should not be inferred that these are the only varieties that suffered, as there was damage done to considerable extent in the case of the other sorts.

Replacing of the severely damaged trees was carried as far as was possible, from the small stock of trees carried in the nursery.

All the regular routine work in connection with the care of the orchard was attended to.

Variety Apple Orchard.

The amount of complete killing in this orchard was comparatively small, and it may be said that the majority of the new varieties from Ottawa have wintered in medium condition, generally speaking.

The following is a list of the varieties which were added to the orchard, in order, as standard and filler trees:—

8 Elmer, 0-2632; 8 Forerunner, 0-2649; 8 Honora, 0-3047; 8 Rupert, 0-3051; 2 Ambo, 0-2608; 2 Craignaivie, 0-3007; 2 Dodd, 0-2562; 2 Drumbo, 0-2601; 2 Emelia, 0-2626; 2 Fameuse Red, 0-2613; 2 Lipton, 0-2634; 2 McCarthy, 0-2553; 2 McKinnon, 0-2543; 2 Okabena, 0-2985; 2 Thompson's 35, 0-2109; 2 Antonovka (Augustin), 0-2987; 2 Golden White, 0-2004.

Cherries and Pears.

These two classes of fruit trees have not stood the severe winters of the past three years, and as a consequence there is nothing but negative results to report. The

cherries have kept killing out, leaving only a few trees that are in very poor condition; while in the case of the pear trees there is nothing of the original trunks left, except the stump at the ground from which new growth is formed each season, only to be killed back the following winter.

Plum Orchard.

In the plum orchard the trees wintered very well and made very satisfactory growth. The standard varieties did not show quite as much vigour as the seedling varieties, but, on the whole, all can be considered very satisfactory.

There was no bloom on any of the trees, which was due to the severity of the winter.

Grapes.

Out of the fifteen varieties planted in the spring of 1915, there are three which have indicated, so far, that there is a possibility of securing fruit, if an average year with favourable growing season is recorded. During the past two years Moore's Early, Wilkins, 0-261, and Herbert, have produced a few bunches of fruit which began to colour before the frost came.

Raspberries.

The raspberry crop was considerably smaller than the previous year. In fact some of the varieties yielded practically nothing.

Herbert died out almost completely, and some damage was noticed on the canes of the other varieties.

In order, the varieties are given as to merit:

King, Brighton, Count, and Sarah.

Currants.

Black.—The following varieties are considered to be of superior quality, from their performance at this Station:—Saunders, Climax, Buddenberg and Victoria.

Red.—As follows: Red Grape, Lees Prolific and Victoria.

White.—There are only three varieties of these, they are given in order of merit:—Cherry, Grape, Large White.

Gooseberries.

The returns from this class of fruit were very small, but the bushes are making very good growth.

Propagation.—Quite a large quantity of cuttings of all the varieties of bush fruits was made, and set out for distribution work. These have developed into very nice plants and will be available for distribution this spring.

An attempt was made to start some grape vines from cuttings, but the success of the venture was not by any means very satisfactory, which was due to the ground not having been well enough drained where the cuttings were stored over winter.

Strawberries.

In the thirty varieties of strawberries which have been under test, there was very great interest taken. This is due to the fact that the prices of this particular fruit have been unusually high during the past few years, with a very scant supply of locally-grown fruit.

The following varieties have been giving good returns during the past three years at this station:—

Senator Dunlap, Buster, Glen Mary, Howards No. 41, Portia (sdlg.), Valeria (sdlg.)

Vegetables.

The work in the vegetable garden is divided into variety and cultural tests.

During the past season almost all the work has been in connection with variety tests, this being done to allow more time to be devoted to seed production. However, some of the cultural tests were continued and brought out some very useful information.

The following vegetables were used in connection with the work: Cabbage, cauliflower, turnip, onion, leek, salsify, egg plant, pepper, radish, lettuce, spinach, beet, carrot, parsnip, beans, peas, corn, tomato, potato, cucumber, squash, pumpkin, citron, melon (musk and water), and ground cherry.

Considerable seed of the following vegetables: Cabbage, beet, parsnip, onion, spinach, Malcolm corn and Gradus peas was grown, some of which was used for seed distribution.

Ornamentals.

In connection with the ornamental grounds, there was considerable replacing of shrubs necessary as a result of the severity of the winter, and also quite a number of the perennial flowers had to be replaced.

Parts of the borders were of such heavy land that it was found necessary to apply a liberal dressing of good, coarse river sand, to remedy the texture of the soil. The effect of this was very soon noticeable, and where formerly there was a very poor stand of plants, all varieties were thriving very well.

Bulbs.—There was a very fine showing in the early part of the season, while the tulips were in bloom.

Annual flowers.—A very satisfactory flower garden was the result of much difficult and up-hill work. Nearly all the varieties came along satisfactorily, supplying a great profusion of bloom from early in July until September 10, when all the flowers were frozen.

Perennials.—The perennials were in bloom from early in the month of May until the hard frost came in September. The range of varieties which are kept in nurseries, in addition to those in the borders, and beds, were a great attraction for visitors.

Flower seeds.—To meet the call for flower seeds, quite a large quantity of very good seed of fairly high germination was saved from the plants in the nurseries, without any great effort, as all varieties of perennials ripen their seed very well. This seed is available for distribution.

Seed distribution.

This year there was no general distribution of garden, vegetable and flower seed, as in other years. It was thought inadvisable to continue this branch of work, since the main idea of creating interest in the value of home grown seed had been brought to the attention of the people very well during the past three years. However, quite a few applications were received, which were filed, and later on seeds sent out.

Potatoes.—The distribution of samples of potatoes was conducted again this year. Five hundred and fifty three-pound packages were sent out.

The varieties used were: Green Mountain, Irish Cobbler, Rose of the North and Early Ohio.

Farm improvements.

The artesian well that was sunk 385 feet in the summer of 1917 has been connected with the deep well pump, which pumps the water from this well into two large pneumatic

tanks, thus furnishing an excellent water supply to all the different buildings connected with this Station. This pump is operated by a 5 h.-p. electric motor with automatic pressure regulator. There was also laid this season 3,000 feet of water mains connecting up this system with all the different buildings.

ROAD WORK.

Considerable work was done on the new farm road running from the Ascot Consolidated School on the northeast corner of this property to the southeast corner. This road has been used by pupils attending this school from the south part of the district.

There were also drawn 520 loads of gravel which was used for surfacing the public roads running through the Farm. This little surfacing of gravel makes it possible to keep our roads in the very best of condition for the heavy amount of traffic that passes over them.

BUILDINGS.

The dairy building that was started in 1917 has been completed and is now ready to have the equipment installed for the farm dairy.

There was built in the months of November and December a new piggery 24 x 60 feet with feed room 16 x 16 feet.

The poultry administration building, which was started in 1917, has also been completed and made ready for work being started the first of April, 1919. There have also been built two colony houses.

The house for the assistant to the Superintendent has been remodelled.

An old house that was located on the Farm near the dairy barn has been remodelled and makes a very useful house for the herdsman.

MEETINGS.

On the 15th of August there was held the fourth annual summer Farmers' Day at the Lennoxville Station, which was attended by over 3,000 people, all showing much interest in the work under way at this Station. Addresses were given at this meeting by the Acting Deputy Minister of the Federal Department of Agriculture, Director, Experimental Farm System: Hon. Senator Foster, Montreal; Mr. Joseph Bégin, Superintendent Experimental Farm, Ste. Anne de la Pocatière; Mr. A. L. Paterson, Mr. T. F. Ritchie and others.

One interesting feature at this gathering was the presenting of medals to the Soldiers of the Soil, who were school boys under the age of eighteen, who devoted their time through the summer months to helping out at agricultural work.

There was also a canning demonstration carried on by the Domestic Science Branch of Macdonald College, under the supervision of Mrs. MacFarlane.

Other meetings were held throughout the winter months with lantern-slide views given principally by the assistant to the Superintendent.

EXHIBITIONS.

This Station's exhibit at the Great Eastern Exhibition at Sherbrooke covered a space 12 by 50 feet, which was very artistically arranged with models of buildings, exhibits of cereals, roots, seeds, sheafs of grain and grasses, vegetables and flowers, and displays of bee and poultry products.

The farm exhibit was also shown at Richmond and the Ste. Scholastique Fair in the county of Two Mountains. The interest manifested in these exhibits was very keen and much literature was distributed and mailing cards secured.

VISITORS.

A very large number of people visited the Farm this past year, much in excess of former years. Much interest seems to be taken in the animal husbandry work that is

being carried on, especially with the dairy and beef herds as well as sheep, swine and horses. There was a large attendance in the garden and grounds throughout the summer months. We are looking forward to much interest being taken in the poultry work which is just being got under way, considering the large number of inquiries we are having in this important branch.

EXPERIMENTAL STATION, SPIRIT LAKE, QUE.

REPORT OF THE FOREMAN-MANAGER, PASCAL FORTIER, B.S.A.

THE SEASON.

As early as the first few days of April the snow had all cleared off and the weather, although cold, was bright throughout the month. May, however, was rainy and cold, rain falling on 14 days and snow on 6 days. June was also rainy and cool, having 14 days of rain, 5 of snow, and frost on 6 occasions. Not only the grains sown at the end of May and during the month did not germinate, or were retarded in growth, but many of the garden vegetables which had been sown or transplanted, died, and, in each case, it was necessary to recommence. July was the best growing month, the only one during which there was no frost. 3·15 inches of rain fell in August, it froze on the 3rd, 16th, 17th, and very hard on the 18th. Beans, cucumbers, melons, citrons, pumpkins, tomatoes and a few potatoes were practically destroyed. Only cabbage, carrots, celery and the roots remained and these gave poor yields, not having done well during the summer. With September, the rainy season commenced and continued, with little interruption, until January 1. Hay was a fair crop, but the cereals, not having matured, made poor forage. It is to be noted that, in this season, only five consecutive weeks were without frost and only two months without snow. The winter, however, from January 1 to April 1, was comparatively mild for this region.

LIVE STOCK.

Horses.—Seven horses were sent to the Experimental Station at Kapuskasing in August, 1918, leaving only 13, of which 10 are heavy draught and three carriage horses. Of the 10 draught horses, 3 are Clyde mares, one Percheron, and 6 other Clydes. The cost of feed amounted to 44 cents per day per horse owing to the fact that nearly all the oats had to be bought, as well as a quantity of hay, most of which had to be purchased elsewhere than in this district, thus greatly increasing the cost of keep.

Cattle.—The herd comprises seven milch cows, of which 3 are Ayrshire and 4 Holstein, one Ayrshire bull, 2 steers, twin Ayrshire heifers and one Holstein heifer calf. The average cost of feed per milch cow per day was 35 cents.

Swine.—At present this Station has 22 hogs, consisting of 4 sows, 1 boar, 16 young pigs and 1 boar to fatten, all Yorkshires. During the year 5 young pigs at four weeks old, having cost about $1 each, were sold for $12 each.

Sheep.—There are now 23 ewes and 2 Cheviot rams, the latter coming from the MacDonald College, Ste. Anne de Bellevue.

Poultry.—All the old birds of the flock were disposed of and 25 Plymouth Rock pullets purchased.

CEREAL CROPS.

Forty-three acres were sown in the spring of 1918, consisting of 30 acres of oats, 5 of wheat, 3 of buckwheat, and 5 of barley. On account of the damp, cool weather, none of the grains reached maturity, so that it is impossible to give the yields. Sixty tons of hay were cut from 50 acres, the average being low, but, in some cases, the yield was 3 tons per acre. Nearly 25 acres were sown to millet, clover and alsike.

CLEARING.

During the year about 30 acres were burned over and 21 acres put under cultivation. In the winter 3 acres were cleared, using different methods with each acre, with a view to find out the cheapest and best way of clearing land.

HORTICULTURE.

Vegetables.—This season produced meagre results owing to the late cold spring retarding planting until the last of May or the first of June. If it is taken into account, however, that there was frost every month except July, the results of the peas, celery, cabbage, carrots, and lettuce were excellent. The more tender plants, as tomatoes, beans, cucumbers, melons, pumpkins and citrons were completely destroyed. Of the four acres of Green Mountain potatoes, those along Spirit Lake were excellent until the frost came, but, when harvested, the remainder, although numerous, were small and immature.

Fruits.—The apple trees suffered from the severe winter, especially the plants received in October 1917. Eighty plants sent from Ottawa in the autumn of 1918 were planted in their permanent location. The nine varieties of strawberry plants sent from the Central Farm are doing well. Red currants and raspberries have given good results.

Flowers.—Many of the flowers were killed by the severe season; the annuals however, promise to succeed in spite of the weather. Certain varieties withstood the frost of the 18th of August and of these the seed was saved to be used next year. The dahlia bulbs were completely destroyed by the frost on September 11.

Ornamental Trees.—Of the trees supplied by the Forestry Service of the province of Quebec, consisting of white elm, white plane, sugar maple, red oak and white ash, many were seriously affected by the severe winter. Of the 396 ornamental trees furnished by the Central Farm in the autumn of 1917, at least 10 per cent are dead.

IMPROVEMENTS.

No new buildings were put up during the year and only the most urgent repairs attended to. With some old material, a sheep-fold, large enough to accommodate 25 sheep, was constructed. A new road for a distance of a half-mile from the Farm to the station, intended as a public highway, has been commenced. A culvert now passes under the railway, carrying towards the lake the drainage from the lower part of the farm; drains have been dug for a distance of a half-mile.

VISITORS.

Although there is need of a passable road from the near-by villages leading to the Farm, yet the visitors to the Farm are more numerous each year.

EXPERIMENTAL STATION, KAPUSKASING, ONTARIO.

REPORT OF THE FOREMAN-MANAGER, SMITH BALLANTYNE.

WEATHER CONDITIONS.

Weather conditions during the month of April, 1918, were the finest seen in this section for a number of years, bright sunshine prevailing 202·3 hours. The soil on well drained areas was in better condition for cultivation during the month of April than at any time during the later spring months, as the weather during the month of May could for the most part be classed as winter weather; very little sunshine being recorded which, with cold north winds for the greater part of the month with snow and rain, caused the seeding operations and work of any kind on the land at this Station, to be delayed. The date of first seeding was May 30, but owing to adverse

weather conditions during the greater part of the following month, seeding was not finished until June 20. The soil at any time during the seeding period was in very poor condition for cultivation. The weather conditions in general during the months of July, August and September, were decidedly unfavourable to crop production, while frost was encountered each month during the season; it cannot be said that great damage resulted, other than damage to potatoes planted on high land which were affected seriously by frost August 3. The months of October and November were not favourable for farm work owing to heavy precipitation which to a great extent retarded our progress in fall ploughing, and general work.

The months of December, January, February and March have been the finest seen in this section during the past fourteen years, the snow fall being very light, with high temperatures prevailing with very little north wind.

METEOROLOGICAL RECORDS.

Year.	Temperature F.			Precipitation.			Total Sunshine.
	Highest.	Lowest.	Mean.	Rain.	Snow.	Total.	
1918.	°	°	°	Inches.	Inches.	Inches.	Hours.
April	68	− 7	32·3	0·075		0·075	202·3
May	80	20	41·7	0·791		0·791	148·6
June	72	26	49·8	0·522		0·522	No recording cards.
July	82	31	57·1	2·883		2·883	151·22
August	77	30	57·2	0·145		0·145	231·05
September	73	29	44	2·752		2·752	75·3
October	64	20	40·6	1·985		1·985	77·1
November	56	− 2	31·3	2·65	4·5	3·1	19·5
December	55	−30	10·2	0·9	6·0	1·5	100·9
1919.							
January	33	−33	6·23		5·0	0·5	79·9
February	37	−24	9·53		9·5	0·95	93·5
March	59	−33	15·97	0·3	5·0	0·8	171·2
Totals				13·003	30·0	16·003	

LABOUR CONDITIONS.

Owing to the scarcity of civilian farm labour, this Station had during the past season to depend mainly on prisoners of war from the Internment Camp here, which to a great extent relieved the labour situation, yet prison labour, owing to shortness of hours worked, could not be classed as satisfactory for farm work, more especially during the harvest season. Shortly after the signing of the armistice, prison labour was withdrawn, which prevented our carrying out the plans made in connection with land clearing operations during the past winter. However, a marked change is noticed in the labour market within the past two months, civilian labour being much more plentiful; and no difficulty is expected in procuring men for farm work during the coming season.

FIELD CROPS.

About 100 acres were devoted to this branch of work.

Fall Wheat and Rye, 1917-18.—Fall wheat and rye sown August 20 and 30, 1917, made a remarkable growth, and matured, yet it is well to state that this crop was in the soil about one year, the dates of harvesting being August 26, 1918, and September 4, 1918. Rye harvested August 26, gave a yield of 22 bushels per acre, wheat harvested September 4, yielding 30 bushels per acre. Owing to extremely wet weather which prevented this crop being harvested sooner than the dates mentioned, a considerable loss was sustained through shelling.

Fall Wheat and Rye, 1918-19.—Eleven and one-half acres were sown August 20 and 26, 1918, which had an excellent stand when winter set in, being well protected during the winter.

Spring Wheat.—A plot of three acres was sown in Marquis wheat, also a three acre plot of Red Fife was sown; date of seeding of both varieties being May 30, 1918. While neither variety matured owing to weather conditions and frosts, there was a marked difference between the two varieties, Marquis wheat being at least three weeks earlier than Red Fife.

O. A. C. No. 21 Barley.—Ten acres were devoted to this crop, which grew very tall and rank, but failed to mature fit for seed.

Peas, Oats and Vetch.—Five acres were sown in peas, oats, and vetch. Peas and vetch were a practical failure, except from seed sown on high land which had been heavily manured, where a satisfactory crop was produced, but the results were, without doubt, far from satisfactory. The oats sown attained a fair height but failed to mature.

Banner Oats, and O. A. C. No. 72.—Seventy-one acres were sown in Banner oats, dates of seeding being from June 1 to June 10. The yield from the above was considered very poor. A marked difference was noted between oats seeding on summer-fallowed land and fall-ploughed land; oats sown on summer-fallowed land matured, while oats sown on the same date, on fall-ploughed land, failed to mature.

Two acres were sown in O. A. C. No. 72 oats, on well cultivated soil. Banner oats proved to be far superior both in height and quality, to O. A. C. No. 72 oats.

Forage Crops.—Seventy acres under timothy and clover, both of which gave satisfactory results when harvested, both timothy and clover being of the finest quality, and have proven of good value for feeding purposes. The yield per acre was 1½ to 2 tons.

Silage Corn.—Silage corn was tried at this Station, but without any results, as the corn planted failed to attain any growth.

Results from plot experiments.—Red clover, timothy and alsike sown in ⅛-acre plots, with nurse crop, without, and in drills, resulted in favour of seed sown in drills, both in quality and quantity.

Forage Plants for Pasture Purposes.—The results from seed sown on a 48-acre tract of stump land during the season of 1917, were most satisfactory, and have provided excellent pasture for stock.

Turnips and Mangels.—Ten acres were planted in turnips, and 2 acres in mangels, on river bottom soil, in a fine location, but the crop was considered a failure, the yield amounting to practically nothing. Both turnip and mangel seed germinated, but no growth resulted, possibly due to excessive precipitation. Results from roots planted at this Station, during the past two seasons, have proven far from satisfactory.

Potatoes.—The potato crop at this Station during the past season must be classed as a poor one, owing to a great extent to heavy precipitation, which flooded river bottom land where the crop was planted; nearly half of the crop was killed by water. The potatoes planted in an area which escaped being flooded produced a fair crop of average quality. This particular area was tile drained, during the past fall, and it is proposed to use it for potatoes, as the soil is well adapted for the growth of these, hence better results are hoped for from this crop during the coming season.

Experiments with Field Grains for Ensilage.—Barley, oats, wheat, peas, and rye, none of which matured fit for threshing, were cut and piled in silo. While this grain was being cut and blown into silo a fine spray of water was kept constantly on ensilage

as it fell from the blower, which resulted in the ensilage coming out in fine succulent condition, proving to be a very nutritious feed for stock, and will to a great extent be a substitute for corn ensilage.

LIVE STOCK.

Horses.—Sixteen grade horses of draft type are used at this Station, being employed at land clearing and general farm work.

Dairy Cattle.—Fourteen milch cows comprise the dairy herd at the present time, 11 Ayrshires and 3 Holsteins. In addition to these there are 8 yearling Ayrshire heifers, and 8 Ayrshire calves, the latter being the progeny of the registered Ayrshire bull, Spring Bank King, Theodore II, who heads the herd.

Beef Cattle.—Twenty-eight head of western steers fed at this Station, during the winter of 1917-18, were sold May 22, 1918, at 12 cents per pound, live weight. Owing to the high cost of feed and labour, the steers sold at a loss.

Shorthorn Stock.—On November 19, 1918, 20 head of grade Shorthorn heifers were purchased, with a registered Shorthorn bull, from which we hope to build up a fine herd of beef type cattle. One heifer has freshened to date. These were carried through the past winter on clover hay and ensilage, and are in fine condition at the present time.

Hogs.—This department of stock comprises 1 registered Yorkshire boar, and 6 registered Yorkshire sows, which are due to farrow during the months of April and May, 1919.

Sheep.—Twelve registered Shropshire ewes, were received at this Station August 26, 1918, from the Central Experimental Farm, Ottawa. One registered Shropshire ram was purchased October 9, 1918. It is hoped to build from the above a fine flock of registered sheep, yet it remains to be proven that this section of Canada is adapted to sheep raising.

Poultry.—No poultry have been kept at this Station to date, but it is hoped that during the coming season, a start will be made with this branch of the work.

GENERAL IMPROVEMENTS.

Land Clearing.—An area of 100 acres was stumped during the season of 1918, prisoner of war labour, when available, being employed. The cost per acre for stumping this land, leaving the same ready for breaking was $43.

Horses were used in removing the lighter stumps, the large stumps being removed by machine stump pullers.

In addition to the above, during the winter of 1918-19, an area of 50 acres was slashed, all timber of commercial value being saved; all brush and cull timber being piled ready for burning. The cost per acre for doing this work was $23.

From this area 400 cords of pulp wood were taken, and 280 logs giving, when sawn, 13,000 feet of lumber, as well as a large amount of fire wood.

Breaking New Land.—Thirteen acres of newly stumped land were broken during the fall of 1918, four horse-teams being used with No. 1 R. R. breaker ploughs. Prison and civilian labour was employed, the cost per acre being $7.50.

Lumbering Operations.—During the past winter, 3,159 logs were cut on this Station's property, 2,759 of which have been hauled to the sawmill and sawn into lumber, giving 137,752 feet. This lumber has been hauled from the mill to the farm

and piled in the yard ready for future building purposes. The total cost of this lumber which includes logging, milling, hauling and piling in yard amounts to $20 per M.

Road building.—One mile of road was graded during the past year, most of which was for the purpose of surface drainage. Owing to the ground being too wet to allow the use of a road grader, the work was done by prisoner of war labour.

Land Drainage.—3,801 feet of tile drain was laid during the past season, in order to have drained several wet areas on the farm. This work was done by day labour.

As the drainage of land at this Station is of vast importance, and having on hand 19,000 feet of tile, it is our intention to have as much as possible of the above laid during the coming season.

Dairy Utensils.—A milking machine of three units was installed during the past season, and is giving good results.

Fencing.—During the past season 430 rods of wire fencing was erected, cedar posts being used, which greatly adds to the appearance of the Station, as well as being a great improvement. In addition to the above, one mile of permanent cedar posts have been erected, with temporary poles nailed on, which affords this Station a protection for stock when on pasture. At a future date wire will be substitued for poles.

Sidewalk.—One half-mile of plank sidewalk was constructed from the railway line to farm buildings, which is a decided improvement.

NEW BUILDINGS.

Herdsman's Cottage.—This building was constructed during the past season. It is a building of 36 feet by 34 feet with concrete basement, and cottage roof, and is equipped with modern conveniences.

Farm Boarding House.—This building was commenced during the past season, the basement and foundation only being completed, which was due to the scarcity of labour. However, the completion of this building will take place during the coming season.

Silo.—A silo with a capacity of 115 tons, was built and has proven a valuable aid to the supplying of feed for stock.

Temporary Piggery.—This building was constructed during the late fall for the accommodation of hogs, during the past winter. It is proposed to replace it with a permanent building during the coming season.

HORTICULTURE.

This branch of work was much affected both by adverse weather conditions and lack of suitable labour during the early spring when it was most needed. Labour supplied by internment operations for this work was most unsatisfactory.

Ornamental Trees and Shrubs.—The trees and shrubs transplanted May 29 and 30, from the trench where they had been kept during the winter of 1917-18, made a remarkable showing during the past summer, very few being affected by either early or late frosts.

This Station received from the Central Experimental Farm, Ottawa, during the past fall, 443 shrubs, which, owing to the ground being frozen when they arrived, had to be trenched in for the winter months. Native trees were planted on both sides of road leading from the railway line to the farm.

Small Fruits.—Currants and raspberry bushes gave a fair yield of fruit, and of good quality. Apple and crab apple trees made a good showing, the percentage of loss since the planting of these trees in 1917 being very small.

The following small fruits arrived at this Station last fall too late for planting: 225 strawberry plants, 84 black currants, 90 gooseberries, 42 red currants, 12 white currants, 218 raspberries, 86 apples, and 20 plums. These have been heeled in for the winter, and will be transplanted this spring.

Vegetables.—Many varieties of vegetables were experimented with during the past season. Corn, beets, cucumbers and cabbage were very poor, cut worms giving much trouble to cabbage and beet plants. Summer frosts affected to a great extent the more tender varieties of vegetables.

Different varieties of peas were tested, good results being obtained from all; special mention can be made of the two varieties, Juno (Thorburn), Thomas Laxton (Rennie). Experiments were carried on with beans, carrots, lettuce, onions, parsnips, and radish, which with the exception of beans were a decided success. The beans were stunted by frost during the month of July.

Perennials, Annuals and Seeds.—Many different varieties of flower seeds were planted, a large percentage of which made a remarkable showing. Nine dahlia bulbs received from Charlottetown, P.E.I., were planted in garden plot, all of which bloomed. Considering the conditions under which sweet peas were planted, the result was most satisfactory.

EXHIBITION WORK.

The forman-manager visited the following places in charge of exhibition work: Fort William, Huntsville, Burks Falls, Thessalon, Sault St. Marie.

The exhibits from this Station, consisted of fall wheat and rye, both in sheaf and threshed. The foreman-manager was in charge of exhibition material from the Central Farm, Ottawa, and great interest was taken by the general public who visited the various fairs, as the exhibit was the first shown by the Experimental Farms in districts above mentioned. Much literature was distributed at the various places visited, particular attention being shown by the public toward the models of buildings demonstrated, and the latest methods of cultivation of the soil.

EXPERIMENTAL STATION, MORDEN, MAN.

REPORT OF THE ACTING SUPERINTENDENT, E. M. STRAIGHT, B.S.A.

THE SEASON.

The winter of 1917-18 was most severe—one of the most trying ever experienced in Southern Manitoba. The snow was not deep, but the cold intense, and high winds frequent.

The spring opened early, however, so that the Station was able to report "Snow all gone" by the 20th of March, with temperature 63·5 F. on the 19th of the same month. Some seeding was done on a few farms before the end of March, but unwisely. Temperatures continued high during April for the season, so that seeding could be proceeded with. Gales were almost constant, the sun being obscured with sand and silt for 50 per cent of the time, and the work made most difficult thereby. This cutting sand destroyed thousands of acres of young wheat, and in some instances cut flower plots and vegetables close to the ground. In some sections the top soil all blew off and buried fences in banks of sand. A grateful rain on the 29th of the month was quite general, and improved conditions much.

The gales continued during May, stronger and more continuous than previous records would indicate for the province. The conditions were aggravated by most rapid change in temperatures and dry weather. On the 5th of May 94 degrees F. were registered, while on the 12th the thermometer dropped to 13·5 above zero. For some weeks following the task for the season appeared hopeless. All vegetation was killed to the ground. Even such hardy plants as rhubarb, cabbage, peas, etc., and the flowering buds of the tree fruits were absolutely ruined. By the end of the month a few showers and calmer conditions had greatly improved matters, and nature was again asserting herself.

June was only moderately warm, and though winds were frequent, yet the damage done by these was mitigated by several showers and one downpour.

As the season advanced the weather continued cold and precipitation much above normal. Growth of all vegetables was remarkable. There was no such thing as holding it in check, so that they went into the frost season on the 9th and 10th of September in rather an unripened condition.

The cereal crops were not affected to the same extent, though the straw was big. The frequent light showers during harvest time made the care of the grain more costly than usual, yet the yield was good and the quality excellent.

The first frost, as previously mentioned, was on the 9th of September, followed by a colder night on the 10th, after which there was much fine weather.

The winter started early and continued late, but exceedingly mild for Manitoba. The lowest temperature recorded was 29 degrees below zero, and that for a very short period. In fact zero readings were rare, but winter lingered until the end of March. Snow for the entire season amounted to a few inches only, and showed little inclination to depart at the close of the fiscal year.

METEOROLOGICAL RECORDS.

Month.	Temperature.		Precipitation.	
	Maximum.	Minimum.	Rainfall.	Snowfall.
1918.	°	°	Inches.	Inches.
April	74·5	6	1·67	2
May	94	13·5	0·63	
June	98·5	40	2·30	
July	92	41	3·9	
August	93	40	2·72	
September	82	21	0·7	
October	74	18	0·47	2
November	57	5	0·83	5
December	40	−28		5
1919.				
January	39	−28		3
February	30·5	−27		5
March	39	−20	Snow and rain 1·12	4

LIVE STOCK.

Horses.—Eight horses are kept at the Station farm at present. During the year four mares and three colts were disposed of. Two of these were sold outright, and the others transferred to Indian Head. It was thought advisable to do this in view of the fact of the great shortage of hay throughout the West. A tractor was purchased in the autumn. This tractor will take the place of four horses on the Farm, and will save considerable quantities of feed. The horses kept at present consist of, one four-horse team of heavy work horses, one two-horse team of lighter animals for use in the horticultural department, one driver, and one animal to be used on the one-horse

cultivator. This arrangement together with the tractor amply takes care of all work on the Farm. All the horses are in excellent condition, and the grades attract attention everywhere.

Cattle.—No cows have been kept at the Station so far, but it is the intention to put in a small herd of dairy animals at no distant date.

Steers.—Thirty steers were purchased in the fall of 1917, and sold at the end of a 151 days' feeding period at some profit. These steers were placed in two pens—fifteen in the barn and fifteen in open front board shed. The average weight of those fed inside was 905 pounds, and those outside 925 pounds. The average gain per steer of those fed inside was 194 pounds, and in the open shed 151 pounds. The profit over feed in the case of the first was $435.33, and of the second $366.95.

Other experiments with steers are being conducted at present. Beside the work of inside vs. outside feeding some comparison of breeds is being made together with the effect of an excess feeding of roots, potatoes, etc., in early season.

Sheep.—The grading up work with sheep continues to be of interest and to attract attention. The grade ewes with which the Station started, were probably as poor a flock as could be found anywhere on the range. The influence of the Hampshire males has been marked. Not only do the lambs show the black face, but the character of the wool is much improved. Taking the entire flock last year, the average clip was a little better than ten pounds per animal, and sold at a considerable advance over the market price. The poorest of the sheep were disposed of in the autumn, and the best of the lambs were used to replace them. The flock consists of eighty breeding ewes and two males. Some work is being done with early lambs. These will be offered for sale at Easter. These lambs at Easter will average over sixty pounds in weight, and show conclusively that winter lambs are possible even on the prairie.

Poultry.—No poultry has been kept at the Station, but we hope to make the poultry industry one of the leading lines on the Farm. There is no lesson which needs to be taught more in this western country than how to get eggs in winter.

Bees.—A start has been made with bees, not so much because of the honey produced as the necessity of bees in the work of pollinating in the orchard and garden. Many gardens throughout the province were more or less failures because of the lack of bees. This was especially true during the past season. Practically none of the vine crops set fruit in the Morden section, but at the Station the showing was excellent. We attribute this largely to the work of the bees. The one colony showed lack of vigour in the spring and continued somewhat weak when it went into winter quarters. Bees at the farm are quite essential for the best work in the horticultural department.

Swine.—No swine have been kept so far, but a few pigs will be taken on as soon as buildings can be obtained for their accommodation.

FIELD HUSBANDRY.

Owing to the newness of the Farm, no definite rotation experiments have been carried on. The great work has been an attempt to clear the farm of weeds, and during the war period to provide as much food material as possible. One block of 60 acres, which had been in summerfallow the year before, was sown to Marquis wheat, and yielded slightly over 30 bushels to the acre. This yield was considerably better than the average in southern Manitoba, though somewhat injured by frost and blowing in early season. Another 100 acres was seeded to oats and barley, which, in the case of the oats, yielded abundantly, and with the barley, fairly well. These coarse grains were used as hay and feed at the Station for the stock kept there.

A considerable area was given to the culture of corn of the varieties "Northwestern Dent" and "Minnesota No. 13." The season was not favourable for corn, yet in late season it grew well, but in no case approached maturity. The new silo was filled, about 100 tons, and has been used for the winter feeding of the steers. This ensilage, though not of the best quality, has been greatly relished by the cattle, except for a small amount around the sides of the silo.

HORTICULTURE.

The 90 acres given over to the horticultural department were all occupied with either orchard or garden in 1918. The grounds in the department are beginning to take on something approaching a permanent character. Large areas were given over to the vegetables and the production of seed, further mention of which will be made under its proper heading.

It has been the policy of the Station and is now, to emphasize the horticultural work carried on there. The development of fruits and vegetables suited to the prairie is a line of work to which little attention has been given in the West. Just what can be done along these lines is not well known, and it is the aim of the Station to find out. Already we are beginning to speak with some confidence concerning many of these. Much work remains to be done, not only in sifting out a foundation stock from the old standard varieties, but in the introduction of new stocks carrying the hardiness necessary for success in the northwest. We are satisfied that by no manipulation of the plant breeder can a tree, vegetable of flower be made hardy except as it carries with it hardy blood.

The land in the horticultural department is level or nearly so, of rather a heavy type—in fact too heavy for horticultural work, but of such a character that heavy yielding crops may be produced when the soil is properly handled. It is especially well stored with nitrogen, so that in seasons of abundant rainfall all crops take on a very leafy and succulent growth, not easily restrained. Potato tops as tall as a man were quite common this past season, and such growth was noticeable all over the horticultural area.

The entire Farm, when taken over, was especially weedy. Much summer-fallowing has been done, but the fight against the weeds is almost constant, and the cost of production thereby rendered high; but some progress is being made. If the policy of the past season is followed for some time to come, the Station will be rendered comparatively free from weeds.

As is well known, the Farm, when purchased, was a stretch of bare prairie. It was wise that it should have been so, for one of the lessons to be taught was, that even the western prairie had possibilities from the horticultural standpoint. Shelter belts of such hardy shrubs as had proven their worth under similar circumstances, were set at the start, and a similar planting continued year by year ever since. Some of this planting has acquired considerable growth, and is affording much shelter even at this time. All of the shelter material made excellent growth during the past season, and is rapidly becoming the wind-break sought for.

THE LARGE FRUITS.

The orchard work was much extended during the season, about 1,200 young trees again being set, and in such a way as to connect the orchard set in 1917 with the first planting done on the Farm. This necessitates the use of several miles of Caragana hedge, which was used as heretofore. These fruit trees were seedlings of hardy varieties, crosses and standard trees of some of our more promising sorts, including many which have been introduced by the Central Experimental Farm, together with Russian varieties. Considerable planting was also done, using seedlings from the

Modern Nursery of hardy apples as well as some of the more promising native plums from the western region. These young trees, as has been mentioned, did well. The loss during the summer was certainly not more than one per cent. It was found that that orchard set in 1917 had suffered much during the winter. Probably this was more or less due to the fact that the trees had made no growth during the previous summer, though given much care and attention. In the first block set, the loss was not great. The most of the standard trees were not only alive but doing fairly well, and the growth during the past summer quite sufficient. In fact 18 or 20 inches of new growth was quite common. It was noticed that the nursery stuff on the south side of the Caragana hedge in almost every case was killed, while on the north side the trees of the same varieties were thrifty enough. This was all contrary to what one would naturally except, and was a surprise to the writer. However, it would seem that the sun's rays on the south side of the hedge had started the buds in early season, so that they froze solid during the next cold night, while on the north side the buds were held back. This fact is one worthy of notice on the prairie.

THE SMALL FRUITS.

The small fruit plantation was given a considerable amount of attention. In the test plots the breaks in the rows were carefully filled in with their varieties, and records kept of their behaviour. It would seem that with proper care the raspberry has a great future in the province. Certainly many varieties are not well suited to the province, but others do very well. Among those which do the best with us are "Herbert," "Sunbeam," "Minnetonka," while others have possibilities in them. The "Turner" appears like an exceptionally hardy variety, but the fruit is not of the best. The red currants also promise well. Among the newer varieties "Diploma" is an exceptionally large berry with large bunch. The black currants and gooseberry have not done well in the past, but the writer looks for a better return during the coming season. The return in quarts from some of the raspberries spoken of was quite the equal of that from the same crops in the East. A half acre or so of raspberries, largely of the "Sunbeam" and "Herbert" varieties, was set, with the expectation of making of this phase of the work a commercial proposition. It was also intended to set a large area of strawberries, but as it was impossible to obtain desirable plants in the right quantity, the idea was postponed for the season. The raspberries set, however, made especially strong growth, and promise well for next year. The canes of all this small fruit planting have been turned down and covered with soil; this has not been found necessary during all seasons, but is a sort of insurance, which, taking the years together, has been found to pay.

VEGETABLES.

More attention was given to vegetable production than at any former year. Beside all the work performed with the testing of varieties and cultural experiments, large acreages were given to peas, beans, potatoes and corn. The potatoes under field test yielded over 500 bushels to the acre, while in the test plots some of the varieties yielded over 700. The year's work would indicate that southern Manitoba has a great future as a potato producing section, especially for seed.

The seasons are slightly too short for the best success with beans, yet certain early varieties are being developed, which will suit conditions in the province. The beans yielded about 20 bushels to the acre, which after being hand-picked, are being offered for seed. About 200 bushels of these beans were produced.

Garden peas also occupied several acres. Some of these were put on the market as green peas, and others carried to maturity. Spinach, radish and other seeds were grown in considerable quantities. This work would indicate that seed production, so far as many of the vegetables go, is quite possible, and may be made a profitable industry.

FLOWERS.

Many of the hardy annuals were grown in hotbeds and transferred to the open. The showing was especially good in late season. The asters, stocks, larkspur and many of the standard varieties were a great delight to the many visitors at the Farm. Small Caraganas were planted around the beds in an attempt to save them from the blowing sand, and answered well. Little work has so far been done with the perennials, but a start is being made this year.

FARM IMPROVEMENTS.

The new sheep shed was completed in early spring, and has been found a most useful building. The building is simply boarded with single rough boards, and 2-inch battens over the cracks. The feed room and lambing room at one end of the building serve their purpose well, and the entire building has served as a model to some visitors.

A new implement shed was built during the season, and in sufficient time to house our Farm implements for the winter. This building was greatly needed at the Station, for the implements were practically out-of-doors. The building was constructed along lines of an exhibition circular sent out by the Central Farm.

A silo of sufficient size to hold 100 tons of ensilage was erected in sufficient time to care for the corn crop. Owing to the fact that stave silos had not stood the wind test in southern Manitoba, the so-called crib silo was built on the elevator plan. These have stood, in all cases, where they have been put up in this section. To add to the strength of the building, and especially to help make it air-tight, the silo was lined with cheap lumber on the inside. When the structure is sided we believe that it will make one of the most satisfactory silos that we have seen in the western country, and just as attractive as any. All of these buildings were given two coats of paint following the colour plan which has been adopted at the Station, namely, a colonial yellow on the side wall with a dark green trim.

Other improvements which may be mentioned are a platform scale, and a well in the sheep pasture. The Station was very fortunate concerning the well. At 16 feet the flow of water was sufficient for all purposes, and though hard, not injurious to stock. On some of the adjoining farms water, fit for any purpose, has not been found.

Roadmaking.—In co-operation with the town some gravel was hauled and the present roadway to the Farm greatly improved. We hope very soon to be able to lay out the permanent roadways, and the approach to the Farm, by extending the main street of the village to and through the grounds.

Barnyard.—Some gravelling was done in the barnyard, but it still requires much work done to make it what it should be.

Fences.—The fences on the Farm were completed so that we are able to report all fences in first-class condition. Woven wire fence with cedar posts, with strand of barbed wire on top, has been used, making the fence all that could be desired.

EXCURSIONS AND VISITORS.

The community picnic was held at the Farm as usual, and proved a success. Not much was attempted in the way of speech-making, except from the Hon. V. Winkler, but the picnic spirit was emphasized, and a good day was enjoyed by all present. The visitors were treated to raspberries grown on the Farm, and much interest shown in

the fruits, flowers and general work of the Station. The Motor League, at the time of the Chautauqua, also visited the Station, together with many visitors day by day. The acting superintendent has not been able to visit the farmers in the outlying sections as much as he would desire, but he has spoken at the farmers' week in Winnipeg, and a number of times in the churches of Morden village. The war has affected the Experimental Farms as much as other lines of work. Each person engaged at the Station has tried to fit himself into various capacities with more or less success. The future for the Experimental Station at Morden is brighter than it has been. We hope to see rapid development during the years to come.

EXHIBITIONS, ETC.

An exhibit of some magnitude was put on at the Agricultural Fair at Morden, but help could not be secured to extend the work through the province. The Horticultural Fair also held in Morden village received considerable attention from us. The exhibit put on by the Station was large, and consisted of fruits, vegetables and flowers grown there.

The Station also co-operated with the province to some extent in sending an exhibit to Kansas city. The exhibit won first place as being the best and most artistically arranged of any in competition with all states and provinces.

The Station also had the honour of supplying the vegetables and a few of the small fruits to the Governor General and party during their visit to Morden. The Farm received a brief visit from the vice-regal party, but it was too short to show the work of the Farm to much advantage. A set of photographs was, however, presented for display in the car, and through them we hope to advertise the Station and its work to some extent.

EXPERIMENTAL FARM, BRANDON, MAN.

REPORT OF THE SUPERINTENDENT, W. C. McKILLICAN, B.S.A.

The season of 1918 was the poorest from a crop production standpoint of any in the history of the Farm with the possible exception of one of the seasons in the 80's just after it was started. The rainfall in 1917 had been abnormally low and very little moisture remained in the soil. The spring of 1918 was very early and seeding was general in the first week of April. Spring crops started well, but high winds did a great deal of damage. The crops on the Farm escaped the blowing out which was general in the district but were burned up badly by the hot winds of June. The rainfall was very deficient, and that, combined with excessive wind, made a light crop of all farm products. The rainfall was greater than in 1917 but on account of it being the second year drought, and other conditions being unfavourable, the crop showed drought effects to a much greater degree.

METEOROLOGICAL RECORDS FOR BRANDON, 1918.

Month.	Temperature F.			Precipitation.				Total Sunshine.
	Mean.	Highest.	Lowest.	Rainfall.	Snowfall.	Total.	Heaviest in 24 hours.	
	°	°	°	Inches.	Inches.	Inches.	Inches.	Hours.
January	−4·6	28·5	−41·0		3	0·30	0·10	93·0
February	0·9	39·5	−38·0		9	0·90	0·40	132·3
March	28·0	64·2	− 6·5	0·07	6	0·67	0·60	167·3
April	41·5	74·0	12·0	0·67	1	0·67	0·21	195·0
May	46·1	92·0	11·0	2·34	½	2·39	0·81	172·6
June	60·8	101·8	32·0	0·97		0·97	0·30	202·0
July	60·6	97·0	37·0	2·47		2·47	1·09	225·0
August	60·4	87·0	37·8	2·09		2·09	0·71	221·6
September	46·3	80·0	26·0	1·33		1·33	0·46	211·0
October	42·3	70·2	20·0	0·96	½	1·01	0·33	141·4
November	26·1	48·8	2·9	0·45	6	1·05	0·42	74·1
December	10.0	36·4	−36		5	0·50	0·30	52·5
Total for year				11·35	31	14·35		1,887·8
Average for 10 years				12·10	46·20	16·60		1,646·6
Total for 6 growing months, April to September						9·92		1,227·2
Average of 10 years for 6 growing months, April to September						11·84		1,267·6

LIVE STOCK.

Horses.—There are twenty-one horses on this Farm on March 31, 1919. Four of these are pure-bred Clydesdale mares, thirteen are work horses, one a driver and three colts. Two of the Clydesdale mares raised foals this year, the other two being too young. Three Clydes and a young grade mare are in foal again this season.

No experimental feeding was done with horses. A record was kept of the feed used by each horse and it was found that the cost of feeding a working gelding for a year at present feed prices was $190.39.

Cattle: Dual Purpose Shorthorns.—The herd consisted of 47 pure-bred Shorthorn cattle and four grades. The milk records of the cows completing milking periods during the year are not as high as in recent years. This is due to poor pastures and lack of the best grades of winter feed, incidental to the drought. However, even under these conditions, two cows produced over 9,000 pounds of milk in a year and most of the others gave over 5,000. The demand for young stock of milking strain continues to be very keen and quite a number of bull calves have been sold to farmers. The young bull "Dictator," bred by S. A. Moore, Caledonia, Ont., was purchased to continue this line of breeding. This bull has some of the best dual purpose breeding and is himself a good individual.

The cost of raising a calf up to one year of age was found to be $77.02; the cost from one to two years, $47.67, and the cost of feeding a mature cow varied from $46.19 to $92.87, depending on her milk production.

An experiment was conducted comparing a ration of which succulent feed (corn silage) was the principal part and the grain portion small with a ration in which there was little succulent feed but plenty of grain. Growing heifers were the kind of stock used. The results showed that much cheaper and better growth resulted from the first stated type of ration.

Sheep.—The sheep are seventy-one in number; fourteen pure-bred Oxford Downs, one Suffolk, one Shropshire, and the remainder grades.

The cost of feeding a mature ewe for a year was found to be $12.19, and of raising a ewe lamb to one year, $8.35.

The sheep grading experiment which has been carried on since 1911 has been completed. Starting with a mongrel lot of range ewes at that time, by the constant use of an Oxford Down ram, a flock has been developed without any purchases of females, that is of uniform type, of good size and while their grade is still visible on close examination, they would pass casual examination as practically pure bred Oxford Downs. The object of the experiment was to demonstrate how quickly and easily improvement and uniformity could be obtained through the continued use of good rams of one breed.

This flock is now being used in a breeding test for the production of market lambs. Continued breeding with the Oxford Down is being compared with crossing with Suffolk and with Shropshire rams.

Swine.—The swine on hand on March 31 inclusive of young litters are, 20 Yorkshires and 20 Berkshires. Thirty-six pure bred sows have been bred for spring farrowing but a number of these are being sold to supply farmers who want to go in for improved breeding.

The cost of feeding a mature sow for one year was found to be $41.40. The cost of raising a young sow from weaning to one year was $29.74.

An experiment was conducted in which "Standard Stock Food" recleaned screenings were compared with barley as a feed for finishing pigs for market. As barley is generally accepted as the best grain for this purpose, this test was intended to find the comparative value of the recleaned screenings for this purpose. These feeds were compared both alone and in combination with mill feeds. The results showed that recleaned screenings were fully the equal of barley for this purpose.

Experiments were conducted with hog pastures. Rye, oats and barley, and rape were used, good results were obtained from all these and it was demonstrated that the cost of feeding growing pigs could be reduced at least 25 per cent by the use of such pastures. Peas and squaw corn were grown to maturity and "hogged off." The results in this experiment were disappointing and the experiment will be repeated before being reported upon.

Poultry.—The breeds kept are the Barred Plymouth Rock and the White Wyandotte. The pullets have been trap-nested and records kept of egg production. Selection of the best laying hens for breeding purposes is practised.

Bees.—Three colonies were wintered over. The dry season was not favourable for honey production but nevertheless a fair amount was gathered.

FIELD HUSBANDRY.

Rotations.—The following rotations have been under test at this Farm for a number of years:—

"D," four years' duration (wheat, wheat manured, oats, summer-fallow): This is purely a grain-growing rotation, except that manure is applied every four years.

"E," four years' duration (wheat, wheat, oats, summer-fallow): This is exactly the same as "D," except that no manure is applied and is a typical grain-growing rotation.

"F," five years' duration (wheat, wheat, corn or roots, oats or barley, clover hay): This is a mixed farming rotation suited to conditions where it is desired to grow both a large amount of wheat and a large amount of fodder for stock.

"G," six years' duration (wheat, wheat, oats or barley, clover hay, pasture, corn or roots): This is also a mixed farming rotation and allows for pasture for stock as well as cropped land.

"H," six years' duration (wheat, wheat, summer-fallow, oats, hay, pasture): This rotation provides both grain crops and hay crops, but omits hoed crop.

"I," six years' duration (flax, oats, summer-fallow, wheat, hay, pasture): This rotation is of similar character to "H," but substitutes flax for one of the wheat crops.

"Q," eight years' duration (roots and peas, wheat or oats, hay, hay, pasture, pasture, pasture, green feed and rape): The land used in this rotation is light and gravelly and is therefore used as a sheep farm.

"W," ten years' duration (wheat, wheat, corn or roots, oats, barley, alfalfa, alfalfa, alfalfa, alfalfa, alfalfa): This rotation is adapted to a dairy or pure-bred stock farm where the chief object of crop growing is the production of a large quantity of good fodder.

The table which follows shows the average cost per acre of operating these rotations, including rent, use of machinery, and all the cost of handling the land and producing the crop (but not marketing). It also shows the average return per acre, and the resultant profit. These figures are based on normal pre-war prices; if present prices were used, much larger returns and profits would be shown.

Rotation.	Cost per acre of operation. Average of 5 years.	Returns per acre. Average of 5 years.	Profit per acre. Average of 5 years.
	$ cts.	$ cts.	$ cts.
"D"	10 19	11 99	1 80
"E"	8 50	10 73	2 23
"F"	11 93	15 98	4 05
"G"	11 38	17 14	5 76
"H"	8 89	12 22	3 33
"I"	9 10	13 76	4 66
"Q"	7 17	7 26	0 09
"W"	10 38	15 85	5 47

Cultural Experiments.—Deep ploughing is giving rather better results than shallow, though the figures obtained are not as conclusive as would be expected.

One ploughing of summer-fallow is giving equally as good results as two and means less work.

The substitution of a pasture crop for bare fallow has reduced the following wheat crop. June ploughing of summer-fallow has proven much better than July.

In seeding down grasses, better results have been obtained where seeding has followed corn or summer-fallow, than where grain was the previous crop, and the larger the number of preceding grain crops, the greater the difficulty in getting a good catch.

Better catches are obtained without a nurse crop than with, but not enough better to pay for the loss of the grain crop.

In breaking up sod of tame grasses and clovers, best results have been obtained by breaking in July immediately after removing the hay crop and working as a summer-fallow during the remainder of the season.

In the application of barnyard manure on stubble land for growing wheat, oats or barley, best results have been obtained with all three grain crops by applying in the fall and ploughing in. The same result was also obtained in manuring for corn.

The substitution of grain crops ploughed in for green manure instead of bare summer-fallow resulted in a decrease in yield. Where the green crops were ploughed in early in July the yield was practically the same as on summer-fallow land, but later ploughed green manured land wasted too much moisture.

The results of a very extensive system of experiments with soil packers have been very inconclusive.

Seeding in various depths from one to four inches has not resulted in any definite conclusions.

The application of commercial fertilizers of various types has brought no return commensurate with cost.

CEREALS.

The usual tests of varieties of cereals have been conducted. For the first time since the introduction of Marquis wheat, it has been excelled in yield by Red Fife. This was due to the peculiarities of the season, which favoured late varieties. On the five-year average Marquis has an advantage of over 11 bushels per acre over Red Fife.

Victory oats gave the highest yield of oats this year, but Banner has the highest five-year average, with Gold Rain a close second. Two rowed varieties of barley excelled six rowed, the variety known as Charlottetown No. 80 standing first. In five-year averages Manchurian has the highest yield. Tests of peas, flax and rye were also conducted.

FORAGE CROPS.

Corn and roots were a fairly good crop, late rains having helped them after other crops were past help. North Dakota White gave the largest yield of fodder corn this year. Northwestern Dent gave a satisfactory yield and had more and better cobs. Peerless Yellow mangels and Invicta turnips were the heaviest yielding kinds. Alfalfa stood the drought much better than any other hay crop with the exception of Sweet clover, which gave a higher yield of a poorer quality of fodder. Brome grass stood the drought best among grasses. Among crops for green feed, oats gave the best results.

HORTICULTURE.

A large number of varieties of vegetables were tested for the purpose of determining the most satisfactory for use in the home gardens of Manitoba, and much information along this line is available to inquirers. Cultural tests to determine the best methods of growing the various vegetables were also conducted. A large number of annual and perennial flowers are also tested. Tests were continued in the growing of fruits suitable for Manitoba.

BUILDINGS.

A new 100-hen poultry house was erected. The piggery, sheep barn and granary were painted brown, with white trimmings to match the new barns.

EXHIBITIONS AND EXCURSIONS.

An exhibit representing the work at the Experimental Farms was shown at Neepawa, Boissevain, Deloraine, Souris, Virden, Dauphin, and Gilbert Plains Fairs. At Manitoba Winter Fair competitive entries were made in some of the horse and swine classes and a creditable showing was made. Among the prizes won were championship for best bacon pig any breed, and reserve championship for Canadian-bred Clydesdale mare.

Thursday, July 11, was set apart as "Farmers' Day" at the farm. A very large crowd came to the farm, estimated at 2,500 people. They were shown the experimental work being done and a programme of addresses was provided.

Several other smaller picnics and deputations came to see the farm and thousands of individual visitors.

EXPERIMENTAL FARM, INDIAN HEAD, SASK.

REPORT OF THE ACTING SUPERINTENDENT, N. D. MACKENZIE, B.S.A.

The season opened early, seeding beginning on the 28th of March and being general the first week in April. However, the high spring winds, the lack of sufficient rainfall and summer frosts made the conditions very unfavourable for the production of maximum cereal and forage crops. Pasture and hay crops were exceptionally light, resulting in some farmers disposing of their surplus live stock in an unfinished condition.

METEOROLOGICAL REPORT, 1918-19.

Month.	Temperature.					Rainfall.		Snowfall.		Total Sunshine.
	Maximum.		Minimum.		Mean.					
	Date.	°	Date.	°	°	Days.	Inches.	Days.	Inches.	Hours.
January	1	39	12	−40	−8·81	. .	.	5	8·25	57·5
February	9	40	20	−37	8·82	. .	.	3	7·25	85·3
March	25	65	6	−12	27·35			5	8·75	134·9
April	9	75	25	10	39·87	4	1·56			176·3
May	4	86	12	15	45·19	4	1·29	2	4·25	175·2
June	10	98	5	28	59·60	3	0·82			247·8
July	18	96	24	31	61·65	8	1·96			242·8
August	8	90	13	40	61·23	10	3·02			221·9
September	7	84	18	13	47·70	2	0·67			168·1
October	3	73	31	15	41·68	3	0·57	2	0·50	117·2
November	15	57	22		26·43	.		1	6	79·0
December	7	37	31	−33	14·29	.		3	9	32·8
Total						34	9·89	21	44·00	1,738·8

HORSES.

The horses number twenty-seven, consisting of twelve pure-bred Clydesdale mares and one filly, fourteen work horses and grade colts.

Experiments have been conducted to determine the cost of wintering work horses, brood mares, idle horses and raising fillies. The following are the data arrived at:—

Work horses, $26.35; brood mares expected in foal, $19.49; brood mares not in foal, $18.85; idle horses, $12.87; two-year-olds, $16.32; three foals (outside corral), $12.24; filly (inside), $16.11.

CATTLE—SHORTHORN (DUAL PURPOSE).

The herd numbers fifty-six, consisting of two stock bulls, five bull calves and forty-nine females. The herd is being strictly bred along dual purpose lines. By rigid selection, retaining only females conforming to beef type and milk production, and breeding to the best sires, many heifers are promising to become heavy milkers without menace to their production of beef.

Numerous inquiries have been received for young bulls of the dual-purpose type, so that our surplus is readily sold at good prices.

The average cost of milk production for the months of January, February and March is $1.54 per 100 pounds.

SHEEP.

The flock numbers one hundred and twenty-four, consisting of flock rams two, ram lambs six; pure-bred Shropshires twenty-eight ewes and thirteen lambs; grade Oxford and Shropshire ewes and lambs seventy-four.

Considerable success was met with in the breeding, one hundred and two lambs being obtained from seventy-five ewes, of which ninety-seven were raised.

Feed costs have been kept throughout the winter. The average daily cost of wintering pure-bred Shropshire ewes is 3 cents, grade Oxford and Shropshire ewes 3 cents, pure-bred Shropshire lambs 2·11 cents, grade lambs 2·36 cents and Shropshire rams 1·98 cents.

SWINE.

The entire herd numbers sixteen, consisting of eight Yorkshire sows, two Yorkshire boars and six Berkshire sows. Many inquiries have been received for young boars and sows, in consequence of which we were able to dispose of our surplus stock.

The daily cost of wintering sows outside cabins is 4·83 cents, young sows inside 4·52 cents. The cost to produce one pound gain, fattening hogs, is 6·25 cents and 6·82 cents.

POULTRY.

Two breeds of poultry are kept, viz., Barred Plymouth Rocks and White Wyandottes. These breeds are well adapted to the conditions prevailing in southern Saskatchewan. Line breeding has been followed with progress.

Poultry breeding is progressing throughout the province. Many orders have been received for hatching eggs and breeding stock, the latter considerably more than we could supply.

During the months October, 1918, to March, 1919, 1,106¾ dozen eggs were laid, and sold at an average price of 44¼ cents per dozen, realizing $490.64. The cost of production was $308.33, leaving a net profit of $182.31.

One hundred and eighty-eight birds were crate-fed, realizing a profit of $30.44.

FIELD HUSBANDRY.

The investigational work in field husbandry has been mainly rotation and cultural experiments. In connection with the former all records are kept to ascertain the cost of production of field crops and the suitability of the rotations for southern Saskatchewan.

Four rotations are under consideration, details of which follow.

Rotation "C"—three years' duration (summerfallow, wheat, wheat). In the grain growing districts this rotation is generally practised.

Rotation "J"—six years' duration (summerfallow, wheat, wheat, oats seeded down, hay, pasture).

Rotation "P"—eight years' duration (summerfallow, wheat, wheat, summerfallow, hoed crop, barley seeded down, hay, pasture).

Rotation "R"—nine years' duration (summerfallow, hoed crop, wheat, oats, summerfallow, wheat, oats seeded down, hay, pasture).

Crop Yields.

Wheat—The yields of wheat varied between 45 bushels and 23 pounds on summerfallow and 7 bushels and 55 pounds on stubble land.

Oats—80 bushels and 23 pounds on summerfallow, and 15 bushels and 17 pounds on stubble land.

Barley—50 bushels and 27 pounds on summerfallow, and 20 bushels and 23 pounds on stubble land.

Field peas—24 bushels and 43 pounds.

Cultural Observations.

Deep ploughing, e.g., 8 inches, gives the largest yields, which yields are augmented by subsoiling, the increase being more apparent on the stubble crop.

Ploughing summerfallow twice is not necessary when land is ploughed early and of a depth of 6 to 8 inches. Autumn ploughing of stubble gives a larger yield. Fall cultivation and spring ploughing for oats has given the largest yield, this being more so when the previous summerfallow was ploughed early and deeply.

Seeding to grass after a hoed crop or summer-fallow is the only means of insuring a good catch.

Break sod early and work as summerfallow.

GENERAL WORK.

The regular work on variety tests was conducted on one-fortieth acre plots. Twenty-one varieties of wheat, twelve of oats, twenty-one of barley, seven of peas and three of flax were tested. Red Fife gave the largest yield of 45 bushels and 20 pounds. Victory, Ligowo and Danish Island oats gave an equal yield of 102 bushels and 32 pounds. Of the barleys Swedish Chevalier gave the highest yield of 58 bushels and 16 pounds. MacKay peas yielded best, 41 bushels and 20 pounds. The flax was a total failure.

FORAGE CROPS.

Corn for Ensilage.—The summer rains came in good time to insure a normal yield of corn for ensilage. The variety grown was North West Dent, which variety is best adapted to local conditions. The yield per acre was 9½ tons.

The selections of the Mandan corn were a complete failure owing to the seed arriving rather late, resulting in immature corn being caught by the fall frosts.

Roots.—Five varieties of turnips, three of mangels, three of carrots, four of sugar-beets, were tested. On account of the high spring winds considerable of the seed was blown out, this being followed by lack of moisture during the early summer the yields were poor.

Clovers and Grasses.—Owing to the unfavourable conditions during the past season no data have been derived from the investigation with clovers and grasses.

HORTICULTURE.

The fruit crop was practically a failure, caused by spring and summer frosts. Cross-bred apples set very little fruit. Plums set well but were frozen before ripe. Small fruits set a light crop which was badly injured by the hot June winds.

Vegetables.

The usual variety tests and cultural experiments were discontinued and the work confined to the production of vegetable seed. On June 10 hot winds almost totally destroyed the garden and very little results were obtained. However, a fair crop of radish, parsnip and spinach seed was harvested. Potatoes did not promise well during the summer but the rainfall during August brought the crop on so that the yield and quality were well up to the average.

Annual and perennial flowers were quite satisfactory and gave a good show of bloom.

Trees wintered well and made a good growth.

Ornamental shrubs were affected by the frosts and produced very little bloom.

EXPERIMENTAL FARM, ROSTHERN, SASK.

REPORT OF THE SUPERINTENDENT, WM. A. MUNRO, B.A., B.S.A.

THE SEASON.

The season of 1918 was deficient in moisture and especially during the latter part. On July 27 there was a rain amounting to 1·4 inches and during the remainder of the season there was not a shower amounting to more than 0·15 inches. Owing to small moisture during the early part of the season there was considerable soil drifting on land that had been summer-fallowed in 1917, or that had been fall ploughed in 1917 and worked down to a fine seed bed. The hay crops were very light but grain and root crops were quite up to the average.

On July 25 the temperature registered 30·6. This did no perceptible damage on the Experimental Station, at the time, other than discolouring the foliage of tomatoes and potatoes, but at harvest it showed its effects on the winter rye which was very much shrunken. This is the first time here that winter rye has been anything but a good crop.

Following is the weather record for the year ending March 31, 1919:—

WEATHER OBSERVATIONS taken at Rosthern Experimental Station.

Month.	Temperature F.			Total Precipitation.	Total Sunshine.
	Highest.	Lowest.	Mean.		
1918.	°	°	°	Inches.	Hours.
April	73·1	10·2	41·12	1·65	235·5
May	79·2	20·2	45·08	1·26	226·2
June	98·7	32·9	61·68	0·93	274·2
July	93·6	30·6	61·73	2·50	330·2
August	86·3	37·8	62·03	0·42	280·7
September	81·2	17·3	49·58	0·23	233·2
October	68·8	5·3	40·155	0·34	150·7
November	53·0	4·2	26·1	0·3	110·2
December	41·9	−27·3	12·45	0·55	59·1
1919.					
January	40·8	−29·5	11·22	0·75	101·9
February	27·9	−44·8	− 2·27	0·6	131·4
March	39·7	−33·5	6·38	1·6	192·7
Total				11·13	2,326·0
Average for years 1912–13–14–15–16–17				14·88	2,195·8
Total for five growing months April to August 1918				6·76	1,346·8
Average for five growing months, 1912–13–14–15–16–17				9·375	1,309·13

LIVE STOCK.

Horses.—In addition to the sixteen horses reported last year, there have been purchased two pure-bred Clyde mares and one of the drivers has been exchanged for a pure-bred Clyde mare. Besides this we have raised two colts. The stock of horses on hand now includes seventeen work horses, one driver, and two yearlings. Of the seventeen work horses, eight are grade Clyde mares and three are pure-bred Clyde mares. Six of the grade mares are in foal.

With sixteen horses for the regular work on the farm, and one extra with the driver for the garden there is ample horse power for the requirements for the Station.

Cattle.—The herd of cattle on the Station has increased to eleven cows and one bull and eight heifers and calves, most of which are pure-bred Holstein. This, it is hoped, will furnish the nucleus of a creditable dairy herd in the near future.

For the fifth time we have bought steers in the fall, and after feeding them till April or May sold them with good profit. In 1917 there were three carloads bought. Forty were two and a half years old and twenty were three and a half years old. Each carload was weighed and fed the same amount of oat and barley chop and hay per weight of steer, and it was found that the older steers made the greater gains and sold for the higher price, but showed the least profit because they cost $1.25 per hundred pounds more than the younger steers at the time of purchase. If three-year-old steers of the same type and condition could be purchased at the same price per hundred as two-year olds, the older ones would make profitable feeders.

In November, 1918, forty-six two and a half year-old steers were purchased on the Winnipeg market. They were fed in two lots as evenly as we could divide them. They were fed the same amount of hay and oat and barley chop, and one bunch was fed in addition ten pounds turnips daily, per steer. Those fed the turnips made a total average gain of 295 pounds per steer as against a total average gain of 263 pounds per steer made by those not fed roots. At selling time a spread of fifty cents per hundred was made in favour of those fed roots. Counting the increase in amount of gain and increase in quality, the roots had a feeding value of $18 per ton.

Sheep.—A flock of one hundred ewes of inferior mixed breeding was purchased in December, 1915, for approximately one thousand dollars and two splendid Leicester rams costing $50 each were put with them. The gross returns for mutton and wool in 1916 was $800, in 1917 $1,200, and in 1918 $1,250, and we have left a much larger flock, and a flock of much superior quality to the one we began with.

Hogs.—A start was made in hogs in the autumn of 1917 by obtaining six sows and one boar of good Berkshire breeding. From these there were raised forty pigs. There were ten brood sows carried over winter in 1918-19. An experiment was planned to determine the comparative values of pastures, but owing to difficulty in obtaining fencing the pigs were run together on various pastures including rape, barley, sweet clover and oats. The total realized for the product of the six sows and one boar in one year was $1,475.

FIELD HUSBANDRY.

A change has been made in the arrangement of the farm by which forty-five acres are devoted to the work of variety tests in grains, legumes, fodder crops, and potatoes. Heretofore these tests have been conducted on summer-fallow alone, but now they can also be carried out on land that had been cropped the previous year. Many of the trial plots in grain were either blown out or buried with drifts from other parts so that there was very little accomplished in the way of deductions as to the comparative yields of different varieties. However, even under such adverse circumstances, Red Fife and Marquis headed the list of all varieties of wheat in point of yield. In oats, Gold Rain yielded highest for the first time since records were kept, with Twentieth Century, Banner, O.A.C. 72, and Victory not far behind. O.A.C. 72 has been tried for three years and is consistently high in yield, but is late in maturing and liable to be caught with the early frosts.

The comparative yields of barley in 1918 were very different from those in former years. For a number of years O.A.C. 21 was highest, but in 1918 it was eighth. The three highest yielders in 1918 were Tagaurog, Swedish Chevalier, and Early Chevalier.

Rotations.—Owing to a change in the direction of the rotations in 1916, the relative values of different rotations could not be fully determined by 1918,

because the effect of such crops as hay or hoed crops cannot be fully realized until after a number of years. It is a notable fact that, in dry years, rotations involving hay and corn do not give as high returns as rotations involving only grain. The yields of corn and hay are not sufficient to warrant the growing of these crops. But, in wet seasons, on the other hand, the returns from the rotations involving hay are much greater than from those involving grain alone. An important consideration in point of raising hay is the fact that during the high winds of the spring of 1918 no part of the farm in which grass had been grown at any time the past ten years suffered from soil drifting, whereas most of that which had not grown grass suffered severely.

Cultural Investigation Work.—The location assigned to cultural investigation work in 1911 proved unsatisfactory after a number of years owing to unevenness in the quality of the land, which could only be determined after trying it for a considerable period. In 1917 a new location was selected, which gives every evidence of uniformity. There was little accomplished in the way of experiment in 1918 because of the short time on the new location, but one experiment was outstanding in its results. The effect of barnyard manure applied to summer-fallow on the following wheat crops gives the most pronounced results, both in the growing and in the yielding, of any experiment we have tried. The effect is also carried through to the oat crop of the next year. The yield in 1918 of wheat on fallow that had been manured was 46 bushels per acre, as against 31½ bushels per acre on land that had been fallowed and no manure applied.

FODDER CROPS.

Hay.—The average yield per acre of hay on thirty acres in 1918 was 1,628 pounds. This was Western Rye grass, half of which had been seeded in 1917 and half in 1916. This yield is quite up to the average for the past eight years, and seems scarcely large enough to justify the growing of hay. But there is the effect of binding the soil, which must not be lost sight of. Soil drifting is a menace which frequently affects this district, and it has been demonstrated on this farm that soil which is seeded to grass once in six years or oftener and left in sod for two years does not drift.

Roots.—Mangels, sugar-beets, carrots and turnips have been tried for a number of years, and it has been found that mangel seed does not germinate satisfactorily. Sugar-beets do not yield well. Carrots require labour in thinning and harvesting inconsistent with the returns, but turnips have yielded well every year they have been tried. On the trial plots in 1918 there were four varieties which yielded over ten tons per acre, Hall's Westbury yielding the highest, 10 tons 886 pounds per acre. Hall's Westbury has been consistently the highest yielder during the past nine years, and is also superior to all the others in point of quality. On a five-acre field this same variety yielded in 1918 at the rate of 10¾ tons per acre.

HORTICULTURE.

During 1917 the trees and shrubs had almost completely recovered from the damage done by the hail storm of 1916 and by the spring of 1918 were in approximately the same condition they had been in two years previously. The evergreens had suffered most. In many cases the leaders were broken and only careful pruning and training could a lateral be utilized to maintain the shape of the tree. All shrubbery made good growth during the summer of 1918, but a great deal of killing was done the following winter. In many cases the killing back was done long before the winter had really set in. There was rank growth till August and evidence would go to show that the new growth was not hardened enough to withstand the early frosts of September. This killing in early autumn applied more especially to fruit trees, young poplars, and many of the ornamental trees.

The success of gardening in this district largely depends upon effective windbreaks. Russian poplar and maple serve this purpose fairly well, but the one outstanding plant for this purpose is the Caragana. It withstands drouth, hail and bad winters and is never affected with insect pests. It grows quickly from seed and requires little attention more than being kept cleared of grass. The seed may be sown in the fall or spring and the next year thinned to one or two feet apart. It should be planted so as to form blocks of garden of about one hundred feet each in width east and west by two hundred feet in length north and south.

Fruits.—An experiment has been under way for a number of years to secure a hardy apple that is at the same time of good quality. We have a few varieties of seedlings that have proved hardy for six years but which have not yet come into bearing.

A large number of plums set out in 1915 are proving hardy but have not yet come into bearing. The fact that several farmers in the district have been growing plums for a number of years indicates that there are good possibilities for the development of plum culture in this part of the province.

Small fruits have yielded profitably every year since they came into bearing in 1914. Following are the varieties recommended:—

Black currants	Climax, Eagle.
Red currants	Stewart, Rankin's Red.
White currants	White Cherry, White Grape.
Raspberries	Herbert.
Strawberries	No. 3 June bearing.

Vegetables.—Cabbage, cauliflower, and celery yielded well in 1918. Trouble is often expressed with respect to growing celery, but we have managed it successfully for seven years. The plants are started in a hot bed, pricked out into a cold frame and transplanted to the garden by the first week in June. They are planted on the level (not in trenches) six inches apart in the rows with six feet between the rows, and kept clear of weeds. No bleaching is attempted till nearly the end of August when the plants are mounded with earth till only the top leaves are exposed. If there is danger of frost they are covered at night with straw and uncovered in the morning, and by the middle of September the celery is ready for use. It is then lifted and planted about four inches apart each way in about four inches of earth in a cool dark cellar and used during the winter.

Tomatoes are a questionable crop any year, and ripe tomatoes very rare. In 1918 there was a poor yield owing to the blight of the blossom due to cold nights.

Roots including parsnips, turnips, radishes, beets and carrots yielded well in 1918. Corn was a failure except in the case of one variety, Peep O'Day, which came to sufficient maturity to ripen.

EXPERIMENTAL STATION, SCOTT, SASK.

REPORT OF THE ACTING SUPERINTENDENT, M. J. TINLINE, B.S.A.

THE SEASON.

The spring of 1918 opened favourably and seeding was possible by April 10. The surface soil was in good tilth but there was little moisture in the subsoil owing to the drought during 1917. Winds were unusually prevalent during the spring, consequently evaporation was excessive. In addition the soil drifting caused by the winds cut the leaves of the young growing plants.

The prolonged drought continued into 1918 and only one rain of material benefit to crops was recorded on the Station and this came in late July. In the northern part of northwestern Saskatchewan there was more moisture and more vegetable growth.

Unfortunately frosts July 24 and 26 caught much of the wheat in this northern section in the flowering stage rendering the wheat crop only fit for hay for which there was a good demand from the farmers in the drought stricken regions south of the main line of the Canadian Pacific Railway.

In the districts where the crops escaped the frost the rain of 1·58 inches on July 27 was most beneficial. The grain plants had wilted down so that each plant had on an average about one single ear bearing stalk. After the rain the stools revived and bore heads, but unfortunately the frosts in early September froze the stools before any kernels except barley became of sufficient size to make feed. The heads on the plants formed before the rain while very short, produced grain of good quality. The additional forage from the second growth was most welcome for feeding stock.

The drought continued throughout the balance of the season and the crops harvested were the lightest in the history of this part of Saskatchewan, varying from no crop at all to yields of from 10 to 12 bushels of wheat per acre.

The ground was frozen too hard to plough in late October but the weather continued mild well into the winter.

METEOROLOGICAL RECORDS, 1918-19.

Month.	Temperature F.			Precipitation.				Total Sunshine.
	Highest.	Lowest.	Mean.	Rainfall.	Snowfall.	Total.	Heaviest in 24 Hours.	
1918.	°	°	°	Inch.	Inch.	Inch.	Inch.	Hours.
April	75·0	3·2	41·2	0·55	0·25	0·80	0·30	241·3
May	80·0	15·6	45·2	0·18	..	0·18	0·08	252·9
June	95·4	27·2	51·6	0·24	0·05	0·29	0·06	314·8
July	98·0	27·2	61·6	1·87	..	1·87	1·58	323·4
August	93·0	35·2	61·2	0·93	..	0·93	0·30	266·3
September	82·0	17·2	45·8	0·19	..	0·19	0·12	177·6
October	70·6	8·2	40·04	0·32	..	0·32	0·32	113·7
November	49·0	− 3·2	25·76	..	0·10	0·10	0·08	111·0
December	38	−28·8	12·73	..	0·275	0·275	0·100	96·3
1919.								
January	41·0	−23·8	14·28	..	0·725	0·725	0·425	79·1
February	37	−45·5	− 2·4	..	0·3	0·3	0·2	89·7
March	38·5	−33·8	5·14	..	0·9	0·9	0·5	168·7
Total for year				4·28	2·6	6·88		
Total for six growing months, April to September						4·26		
Average for eight years						13·58		
Average for eight years for six growing months, April to September						10·64		

LIVE STOCK.

Horses.—There are sixteen head of horses on the Station; of these six have been raised and in addition one team of young geldings has been sold during the year at a good figure. The experimental work has consisted in securing data on the cost of feed for work horses, and the cost of raising horses.

Cattle.—Nineteen steers fattened during the winter of 1917-18 were sold in May at an advance of $50.53 per steer over autumn prices. The net profit per steer amounted to $17.77. Steers fed in a straw shed gained in flesh more rapidly than steers fed in a corral, with an eight-foot tight board fence and with a frame shed open on the south side for shelter. Ten steers that were hornless at the time of purchase made an average gain of 119 pounds, while eight steers dehorned in November only made an average gain in the same period of 64 pounds. Owing to the shortage of all kinds of feed, no winter feeding experiments were conducted during the past season.

The only cattle on the Station at the present time are one milch cow and one heifer, both grade Holsteins.

Sheep.—The flock of sheep was valued on April 1, 1918, at $1,753. Sales of wool and mutton totalled $1,396.11. Increase in value of $563, less purchase of one ram, $50, makes a gross return of $1,909.11.

The experiments with sheep consist of grading up, using range ewes and Shropshire rams for foundation stock, testing out breeding ewe lambs and a comparison of oats and barley with standard screenings for wintering lambs. The lambs fed screenings made the most economical gains. The roughage for the sheep consisted of wheat hay supplemented with oat sheaves in the late winter.

Swine.—The swine on the Station are pure-bred Berkshires. Small portable cabins are used for housing for both summer and winter. Alfalfa gave early spring pasture, while Western rye grass and rape were pastured during the latter part of the season. An average of eight pigs per litter were raised and used in the feeding experiments. The main experiment was a comparison of the self-feeder with the open trough method in feeding out of doors. Four tests were made during the year. The average daily gain per pig from all the tests from the self-feeder lots was 1·98 pounds. While the daily gain from the pigs fed in the troughs only amounted to 1·32 pounds.

A comparison of the number of pounds of grain to make one pound of gain showed that an average of 4·46 pounds was required in the self-feeder lot and 5·27 in the trough-fed lot.

In all 71 fat hogs were marketed. One two-year-old boar was sold and replaced with a younger animal of different blood. At the end of the year there are 10 young brood sows and 1 boar on hand.

POULTRY.

Four colony houses for poultry have been erected. The stock now consists of 197 birds principally of the Barred Rock breed. One pen of Buff Orpington pullets from eggs purchased to fill the incubators were selected out and kept for breeding. The equipment consisted of two Tamlin and one Prairie State incubator; to these has been added an Essex Model. A Candee coal-burning brooder has been used in one of the colony houses for rearing the chicks, with satisfactory results. Owing to the war regulations the feed has consisted mainly of oats and barley. Some bran and wheat screenings have been used, also beef scrap, oyster shell and roots.

The main experiments have been a comparison of hens versus pullets for egg production and fertility of the eggs. Records have been kept of the hatches secured from the different types of incubators and from the eggs set at different periods of the hatching season. Crate fattening was tried with profitable results. A comparison of early, medium and late hatching pullets for winter eggs has demonstrated the advisability of having March and April hatched birds.

FIELD HUSBANDRY.

Rotation of Crops.—The following rotations have been under test on this Station for a number of years:—

"C"—Three years' duration (summer-fallow, wheat, wheat).

"J"—Six years' duration (summer-fallow, wheat, wheat, oats (seeded down), hay, pasture).

"P"—Eight years' duration (summer-fallow, wheat, wheat, summer-fallow, peas, barley (seeded down), hay, pasture).

"R"—Nine years' duration (summer-fallow, peas, wheat, oats, summer-fallow, wheat, oats (seeded down), hay pasture).

In seeding down, 10 pounds of Western rye grass, three of Red clover and three of alfalfa are mixed with sufficient seed grain for one acre and sown with the grain drill. While good catches of clover that have wintered over have been secured, the growth of clover has usually been weak due to lack of moisture.

The rotted barnyard manure has been ploughed under during the summer-fallow year; in the two rotations including peas the manure was applied at the rate of 15 tons per acre.

The following table shows the average cost per acre of operating including rent of land, use of machinery, cost of working the land and handling the crops. In addition the average returns per acre and net profit per acre are included. These figures are based on pre-war prices and cover a period of six years.

Rotation.	Average cost per acre for six years.	Average returns per acre for six years.	Average profits per acre for six years.
	$ cts.	$ cts.	$ cts.
"C"	7 17	11 25	4 08
"J"	6 89	12 19	5 30
"P"	7 82	11 14	3 32
"R"	7 69	12 58	4 89

Rotation "J" has consistently given the highest net profits per acre during the time the rotations have been in operation. This rotation is now used on the larger fields on the Station.

CULTURAL EXPERIMENTS.

In the Cultural Investigational Work the prairie breaking experiment is now well on the way to completion. The sod land reserved for this experiment has all been broken up, consequently, the part of the experiment remaining is to determine the effects on succeeding crops of the different systems adopted in breaking the land. The average yield per acre for a four year period of green feed grown on spring breaking is approximately one ton per acre. The average yield for flax grown under similar conditions is a little more than eight bushels per acre. After taking these crops off, the land has been back-set in the fall and worked down and sown to wheat the following year. The average yield of wheat after the green feed for a five year period is 14 bushels and 41 pounds per acre and after flax 16 bushels and 41 pounds. During this same period land broken four or five inches deep during the summer and cropped the next year has given an average yearly return of 21 bushels and 49 pounds, while the yield from land that was broken shallow and back-set has been 20 bushels and 35 pounds.

Rates of Seeding.—Rates of seeding experiments have been carried on with wheat, oats and barley commencing with three-quarters of a bushel of wheat and running up to two bushels and with one bushel of the other grains and running up to three bushels. The season being so exceptionally dry the lighter seedings have generally given the heaviest crops.

Dates of Seeding.—In the dates of seeding experiments the early sown barley and oats were damaged by the spring frosts. Notes taken in the spring show that the grain crops withstood the spring frosts in the following order: wheat, spring rye, oats, barley, flax.

CEREALS.

The yields from the cereal tests and from the seed plots were unusually low owing to the drought. Seventeen varieties and strains of wheat were grown in the uniform test plots and of these the Marquis and Red Bobs gave the heaviest yields. The wheat

threshed from the Marquis weighed ½ pound per bushel more than the Red Bobs. Banner oats proved their ability to withstand adverse conditions by outyielding the Victory by four bushels per acre. This is the first time that the Banner has given heavier yield than the Victory. All yields of barley were low and the quality of the grain poor. The two-rowed sorts have again given heavier crops than the six-rowed. The Duckbill, a two-rowed sort, and the O A C No. 21, a six-rowed, were two of the most promising varieties under test. The former has a very strong straw for two-rowed barley. Peas were a failure; while the growth of vines was vigorous for such a dry season, the blossoms were frozen in July and an early September frost destroyed the pods. Flax plots were destroyed by a windstorm in June. Spring rye outyielded the barley, withstanding the spring frosts and dry weather much better. Fall rye was again winter killed very badly. In order to determine the best time of the year to sow the fall rye and value of the grain stubble to hold the snow and thus protect the crop a series of experiments along this line has been commenced with the fall rye.

FORAGE CROPS.

While the yields of all classes of forage crops were low yet the drought had the important effect of demonstrating the superior powers of some forage plants to produce profitable yields on a meagre supply of moisture. Two outstanding crops in this respect are the Western rye grass and Sweet clover. In several parts of the experimental fields the rye grass and timothy were grown on adjacent plots. In every test the rye gave fair returns while with a few exceptions the timothy was not worth cutting. Sweet clover thrived well giving two cuttings; the highest yield per acre for the season being two ton 680 pounds of cured hay.

HORTICULTURE.

Fruits.—The new wood ripened rapidly on the fruit trees and fruit bushes in the autumn of 1917, consequently, there was little winter killing. Spring frosts caught the early blossoms on the currants decreasing the yield by at least 50 per cent. Strawberries and gooseberries gave fair returns as the fruit matured early in the season but the raspberries ripened later were more affected by the drought. As in previous years the importance of growing the hardiest varieties of bush fruits and strawberries has again been clearly demonstrated. The Dakota strawberries, Houghton gooseberries and Sunbeam raspberries are three outstanding varieties in this respect. In the currants there are several varieties that were nearly equal. Dr. Saunders' selections proved much heavier yielders than any other varieties.

Vegetables.—Shallow sown seeds failed to germinate until the soil was moistened by the late July rains. As a result of the drought much of the vegetable garden was a failure. The greater part of the work for the season was planned along the line of seed production; cabbage and celery were two of the main crops used and a considerable number of heads of each were saved for seed production work in 1919.

For the first time in the history of this Station potatoes were produced at a loss, being due not so much to the drought as to frosts in late July that froze the shaws and checked the growth of the tubers for approximately one month. The tubers had just started to grow again when the vines were frozen by frosts in early September.

Ornamental Gardening.—The growth of trees and shrubs was weak, due to the lack of moisture. Perennial flowers generally made a splendid showing considering the season. While the plants were not quite as large as usual the blooming was almost as free as that secured in more favourable years. Annual flower seeds sown in the flower beds failed to germinate but transplanted plants from the hotbeds thrived fairly well and helped the appearance of the flower border considerably.

MEETINGS.

During the mid-summer months the following organizations held picnics and excursions to the Station: Local Grain Growers' Association and Farmers' Club, Broadacres Educational League, Grassy Lake Grain Growers' Association, Cut Knife Agricultural Society. The Acting Superintendent acted as judge at a number of the rural fairs, addressed several agricultural society meetings and assisted with the Short Course in Agrienlture at the Agricultural College, Saskatoon.

EXHIBITIONS.

The exhibit sent out from the Scott Station supplemented the travelling exhibit from the Central Experimental Farm at the Saskatoon Fair. In addition, the following fairs were visited: Naseby, Unity, Wilkie, Cut Knife, North Battleford and Kelfield. The Acting Superintendent and one of the farm staff were in attendance at each of the fairs to answer questions relating to the experiments conducted on the Station.

VISITORS.

Approximately 3,000 persons visited the Station during the year.

FREE DISTRIBUTION OF SAMPLES.

A total of 225 samples of potatoes were distributed and in addition 71 parcels of trees and fruit bushes were sent out and 280 packets of flower and Caragana seed.

EXPERIMENTAL STATION, LETHBRIDGE, ALTA.

REPORT OF THE SUPERINTENDENT, W. H. FAIRFIELD, M.S.

THE SEASON.

The season of 1918, on account of the very scanty rainfall, proved extremely disastrous in nearly all parts of Southern Alberta. The rainfall recorded at this Station from April 1 to July 31 amounted in all to only 2·31 inches, while the normal precipitation for these four growing months for the last seventeen years has been 8·27 inches. In regard to the amount of moisture carried in the soil from the year previous, which is always an important factor in considering any season's results, it might be said that the precipitation during September, October and November in 1917 was only 2·39 inches while the average for these months is 3·06 inches. Therefore, considering that the stored moisture carried over in the subsoil was extremely light, combined with the very small amount of rainfall that fell during the period of growth in the spring, the remarkable thing was, not that there was a crop failure, but rather that any grain at all was produced even upon well-prepared, summer-fallowed land. Of course, on land not summer-fallowed in 1917 no grain at all was produced.

The winter of 1917-18 was colder than usual. The snow that fell remained on the ground so that with the continued cold weather farmers were compelled to feed their live stock much more hay than is ordinarily necessary. Live stock generally were not in as good order as usual by spring, sheep as a class suffered most, the lamb crop being unusually light.

The first work on the land was done April 3; seeding was started on the 7th. The last frost in the spring occurred on the morning of June 3, when the minimum temperature recorded was 31·5. The first frost in the fall was on September 15, when the temperature dropped to 28·0°.

On irrigated land the yields of grain were very satisfactory where the crops were irrigated at the proper season. Unfortunately there was a general shortage of irrigation water due to the fact that the Company's main canals had been allowed to "silt up" unduly during the three wet seasons that preceded 1918. Fortunately however, this shortage was not felt till most of the farmers had irrigated their hay crops, so that, generally speaking, the yields of hay were about normal. In fact alfalfa produced a particularly abundant crop, as the farmers gave special attention to the irrigation for the second cutting.

METEOROLOGICAL RECORDS.

Month.	Temperature F.			Precipitation.	Sunshine.
	Maximum.	Minimum.	Mean.		
1918.	°	°	°	Inches.	Hours.
April	77·0	6·0	41·9	0·13	259·5
May	80·0	21·0	47·9	0·58	246·9
June	89·5	29·0	61·6	0·755	356·8
July	94·0	35·0	62·6	0·85	314·2
August	93·0	33·5	62·5	1·23	311·7
September	83·0	32·0	54·5	1·07	215·6
October	78 0	11·0	46·16	0·24	169 0
November	59·0	1·5	32·77	0·43	129·0
December	53·0	−11·0	29·2	0·46	79·0
1919.					
January	57·0	− 5·0	34·27	0·06	105·1
February	60·0	−16·0	14·3	0·95	94·1
March	62·0	−35·0	16·4	0·75	151·7
				7·505	2,432·6

LIVE STOCK.

Horses.—At present there are twenty head of horses at the Station, which comprise draught horses, drivers and colts. The heavy draught horses include two imported Clydesdale mares and several grades. The horses are in good condition, practically all being wintered in an open corral. Breeding operations were very satisfactory during the year, the four foals making excellent progress.

Cattle—Feeding Tests.—Feeding tests were again carried on during the winter of 1917-18. Thirty-eight, two- and three-year-old steers were purchased in December, 1917. They were divided into two groups and fed in open corrals. Twenty of the largest and best steers were placed in group 1, the object being to finish them in as short a time as possible. They were fed 119 days and sold March 31, 1918, at $12 per hundredweight, less 2½ per cent shrink. The net profit per head was $20.12, and it cost 21 cents to produce one pound of gain. The remaining eighteen steers in group 2 were put on a longer feeding period lasting 162 days and were sold May 16 at $15 per hundredweight, less 2½ per cent shrink. They realized a net profit per head of $41.76, costing a little over 20 cents per pound gain. The following high prices were charged for food consumed: Alfalfa hay, $17 per ton; green feed, $17 per ton; meal (oats and barley), $2.35 per hundredweight, and screenings (ground), $2.10 per hundredweight.

A feeding test with twenty-two head of steers is under way during the winter of 1918-19, comparing alfalfa hay with cut roughage made up of two parts alfalfa hay and one part straw. The steers will be fed till early May.

Milch cows.—Three grade milch cows are kept to supply milk to the employees on the Station. A pure-bred Shorthorn heifer (milking strain) was obtained in exchange for some grade stock, during the year.

Sheep.—At present the farm flock consists of grade Shropshire ewes bred up from a Merino base. The flock is made up of 41 ewes, 35 shearling ewes, 27 ewe lambs, and 1 Shropshire ram. In the spring of 1918 the lamb crop was very satisfactory, 39 ewes out of the 41, or 95 per cent, dropped 68 lambs, 62 of these or 91 per cent were raised, thus showing an increase from the 41 head of 151 per cent. At six months old, 24 of the wether lambs, averaging 85 pounds, were sold at 15 cents per pound, netting $12.75 per head, which clearly demonstrates the value of marketing lambs early. The sheep were sheared in May, netting 785 pounds of wool, averaging a little over 10 pounds per head. During the year 7 pure-bred Lincolns (6 ewes and 1 ram), and 5 pure-bred Rambouillet ewes were purchased, preparatory to conducting breeding experiments.

Feeding Tests.—A winter feeding test with two deckloads of lambs was carried out in the season of 1917-18, along similar lines to those followed the past three or four years. One deck of lambs was sold at the end of March, showing a profit of $1.69 per head. The second deck was sheared early in April and put on the market about the middle of May, realizing a profit of $5.27 per head. The first deck was composed of home-grown and range lambs. The home-grown showed a profit of $1.85 per head as compared to $1.50 per head for range lambs. The second deck was divided into two lots, group 1 receiving mixed grain, and group 2 screenings. It was found that it took 105·9 pounds of screenings to equal 100 pounds of grain (equal parts of barley and oats) or screenings were 94·4 per cent as efficient as the grain. A feeding test with 220 head of range lambs is under way during the winter of 1918-19.

Swine.—Six pure-bred Berkshire sows, one grade sow and one pure-bred Berkshire boar constitute the foundation stock at the Station. Young pigs were fed during the past season, part with self-feeders and part hand-fed. The tests have not been conducted a sufficient length of time to draw conclusions therefrom, but it may be said that those which were hand-fed made better gains on less feed than those fed with self-feeders. An experiment in "hogging off peas" was conducted during the summer. Twenty-five pigs were turned in a field of 4·9 acres of field peas on August 1 when the peas were in the thick dough stage. The animals had access to water but no other feed. They were weighed off November 4, at which time the pigs had ceased to make rapid gains. It was found that 260 pounds of pork per acre was produced which at 15 cents per pound (the price at which the pork was sold) yielded $35 per acre. There was still enough scattered peas on the ground to winter our brood sows. They came through the winter in excellent condition getting only what they picked up from the ground except during short periods of severe storms.

POULTRY.

The farm flock at the present time consists of 200 Barred Rocks and 35 White Wyandottes. In the spring of 1918 fair success was obtained in the hatching of chicks. During the summer they made excellent progress, the first pullet laying when she was 144 days old. During the winter all the pullets laid well, averaging 65 eggs each for the 4 winter months, six individuals laying 100 eggs or over during this period. One hundred and forty cockerels were sold during the winter for breeding purposes, and the demand this spring for both male birds and for hatching eggs is greater than can be supplied. Trap nesting of the pullets is being carefully carried out.

BEES.

The results from the apiary for the season of 1918 were fairly satisfactory. Two out of the three colonies came through the winter, but one of these was weak and did not become productive until well on in the season. The two colonies produced 173 pounds of extracted honey, or an average of 86·5 pounds. The better one produced 144 pounds.

FIELD HUSBANDRY.

The comparative tests with the various rotations continue to furnish valuable information and data on the cost of production of field crops as well as to show the best arrangement of the crops. The following is a list of the rotations under test:—

Rotations on Non-Irrigated Land.—Rotation "A" Wheat Continuously; Rotation "B" two years duration Wheat, Summer fallow. Rotation "C" three years duration Summer fallow, Wheat, Coarse grain. Rotation "M" six years duration Summer fallow, Wheat, Coarse grain, manured in fall, Summer fallow, Peas and Oats for Hay, Barley or Oats. Rotation "S" nine years duration, Summer fallow manured for hoed crops, hoed crops, Wheat, Summer fallow, Wheat, Coarse grains, Summer fallow, Peas and Oats for Hay seed to Fall Rye, Rye pasture. Rotation "T" ten years duration, Summer fallow, Wheat, Oats or Barley, Seed to Alfalfa, Alfalfa hay or seed for two years, Summer fallow, hoed crop, Wheat manured in fall.

Rotations on Irrigated Land.—Rotation "U" ten years' duration, seeding Alfalfa, Alfalfa for five years, hoed crop, Wheat, Oats, Barley. Rotation "V" Alfalfa continuously.

The following table shows the average cost, the returns and profit per acre for the past seven years, of the various rotations. These values are all figured on normal pre-war prices, so that the years are comparable. If the present return values were used the profit would be much greater:

Rotation.	Duration	Average cost per acre for 7 years.	Average returns per acre for 7 years.	Average profit per acre for 7 years.
	Years.	$ cts.	$ cts.	$ cts.
Non-Irrigated Land—				
"A"	1	8 65	17 54	8 89
"B"	2	7 63	12 64	5 01
"C"	3	7 16	14 47	7 31
"M"	6	9 56	15 02	5 46
"S"	9	9 57	14 71	5 14
"T"	10	9 74	20 32	10 58
Irrigated Land—				
"U"	10	17 56	62 93	45 37
"V"	1	9 24	52 79	43 55

CEREALS.

The yields of all cereals on the dry or non-irrigated land were light on account of the very dry season, in fact no crop at all was obtained except where sown on summer-fallowed land. Good results were obtained from the irrigated plots and compared favourably with past years.

On the dry land, Marquis and Red Fife each yielded 14 bushels per acre, although Huron stood at the head of the 16 varieties of spring wheat tested, yielding 15 bushels per acre. Of the seven varieties of oats, Gold Rain, Irish Victor and Victory proved the best with a yield of 35 bushels 10 pounds per acre. Eleven varieties of barley were tested, Gold giving the best yield, closely followed by Swedish Chevalier and Bark's. With field peas MacKay stood at the top of the seven varieties tested yielding 17¼ bushels per acre. Long Stem Flax leads in the six varieties under test.

On the irrigated land, of the varieties of spring wheat tested, Marquis stands at the head in the average results for the past five years with an average yield of 65 bushels and 47 pounds. It yielded 61 bushels and 38 pounds this season. Of the six varieties of oats tested, Danish Island and Banner were the best, with yields of 107 bushels and 104 bushels and 19 pounds respectively. Eleven varieties of barley were tested, Bark's leading with a yield of 107 bushels and 24 pounds per acre, followed by

Swedish Chevalier, which yielded 91 bushels and 20 pounds per acre. With field peas, Mackay heads the list with a yield of 66 bushels per acre. Long Stem flax, yielding 45 bushels per acre, leads in the six varieties of flax tested.

FORAGE CROPS.

Indian Corn.—Three varieties were grown this past season. The yields on the dry or non-irrigated land were very low, Yellow Flint leading with a yield of nearly 6 tons per acre. On the irrigated land, Yellow Dent again leads with a yield of over 16¼ tons per acre. The results with corn were somewhat unusual in that several of the early varieties ripened seed.

Roots.—Of the seven varieties of turnips tested during the past season, White Globe leads on both dry and irrigated land, yielding a little over 6½ tons per acre on the dry land and 22 tons on the irrigated land.

In the mangel test, Giant Half Sugar White was the best variety, yielding nearly 17 tons per acre on the dry land and 48 tons per acre on the irrigated land. No results were obtained with carrots on the irrigated land, but on the dry land Imperial Short White yielded nearly 18 tons per acre. Six varieties of sugar-beets were tested, Wohanka proving the best on both dry and irrigated land.

Mangel Seed Production.—This is the first season's experience in handling and harvesting of mangel seed. Nine hundred pounds of seed were obtained from 1½ acres. Sixteen acres of stecklings were also harvested, and have kept through the winter in fine condition. About half of them were stored in a root cellar and the other half in pits in the field.

Grasses and Clover.—Alfalfa is the main hay crop on the irrigated lands in the Lethbridge district, averaging around 4 tons per acre. On the dry land this year there was practically a failure of grasses and alfalfa.

Pastures.—The pasture giving the best returns on the irrigated land this past season was a mixture of Western Rye grass 6 pounds, Kentucky Blue grass 6 pounds, Meadow Fescue 6 pounds, and alfalfa 4 pounds per acre. The results again go to show that the addition of alfalfa to the mixture more than doubles the carrying capacity.

HORTICULTURE.

Fruits.—The trees, with only one or two exceptions, of all varieties of apples except the crabs have now succumbed. Practically all varieties of Dr. Saunders' cross-bred crabs have withstood the recent severe winters. Late frosts, however, destroyed the fruit crop. The late frost also destroyed the blooms on the plums. For the first time the black currant bushes died badly. The crop of fruit on the red and white currants was light. A normal yield of fruit was obtained from the raspberries. The strawberry crop was only fair.

Vegetables.—A good crop of the hardy vegetables was harvested. The season, on account of the drouth, was warmer than usual, consequently the yield of ripe tomatoes was very much higher than usual. Practically the entire crop of the extra early sorts ripened fully before killing frosts occurred. The corn crop was particularly good.

Potatoes.—The crop on the dry land was light; on the irrigated land the yields were normal.

Ornamental Gardening.—Each season shows an encouraging growth in the trees and shrubs planted on the station. The native cottonwood continues to make an

excellent showing, and it is without doubt a tree particularly suited for this district. The hardier ornamental shrubs did well, but the bloom was not as profuse as usual. The fine showing made by the hardy herbaceous perennials is only further evidence that these are worthy of a permanent place in all gardens in this part of the province. The usual assortment of annual flowers were grown, and displayed an attractive mass of colour during the latter part of the season.

DOMINION EXPERIMENTAL STATION, LACOMBE, ALTA.

REPORT OF THE ASSISTANT TO THE SUPERINTENDENT,

B. C. MILNE, B.S.A.

THE SEASON.

Work on the land commenced earlier in the spring of 1918 than in the previous year. Diseing was started on April 9, while the first seeding commenced April 13. The land was in splendid shape and had a good supply of moisture. Seeding was finished during the first three weeks of May, with the exception of those areas upon which green feed was sown. The weather was dry and windy during the greater portion of May and many of the cereal crops of Central Alberta suffered from frost. While the early part of June was a repetition of May, a good rain fell during the last week, supplying moisture sufficient for the immediate needs of grain crops. In July a severe frost did much damage to crops over Central and Northern Alberta. Harvest commenced on August 10 at this Station, and was general during the latter part of the month throughout this district. Continued dry weather favoured all harvesting operations, and enabled farmers to do considerable fall ploughing, after finishing threshing.

The winter, with the exception of two weeks in February, was one of the mildest on record, and as a result great savings were effected in feed, while livestock wintered outside came through in splendid condition. The snow fall was light, not more than eight inches lying on the ground at any one time.

METEOROLOGICAL RECORDS.

Month.	Maximum.	Date.	Minimum.	Date.	Precipitation.	Sunshine.
1918.	°		°		Inches.	Hours.
April	69·3	20	3·9	2	0·46	236·3
May	78·8	3	18·9	19	0·94	195·8
June	85·3	22	26·4	2	1·47	259·7
July	92·6	19	32·9	4	1·24	296·9
August	89·8	1	32·7	28	3·93	242·3
September	83·4	12	25·4	14	1·125	212·9
October	75·8	5	10·9	23	0·015	157·2
November	56·3	1	4·9	23	1·20	118·5
December	45·8	2	− 8·1	13	0·725	60·2
1919.						
January	48·8	9	− 6·0	2	0·21	74·2
February	47·0	10	−40·6	25	0·818	100·7
March	56·3	31	−30·3	4	0·77	156·1
					12·903	2,110·8

LIVESTOCK.

Horses.—There are now 26 head of horses at this Station, made up of registered Clydesdales, Percherons, Hackneys, and grades. All mature horses which were idle

during the winter were fed in the open on green feed and hay, at a cost of 26.2 cents per day. Young horses were fed in a similar manner but were put in the barn at night. All made a considerable gain in flesh.

Dairy Cattle.—This Station now has 29 head of pure-bred Holstein cattle, besides 21 grade Holsteins. The output has been made into cheddar cheese, which was sold locally at 25 cents per pound. The average lactation period, of all cows, which finished during the fiscal year, was 379 days, while the average record of production was 7,539·1 pounds of milk. Among this number were several heifers which were fresh for the first time. The average return per cow for the year, for her product made into cheese, has been $188.25. The Holstein herd bull, "Prince Aaggie Mechthilde," is leaving some very promising stock, which show great scale, feeding capacity, and constitution.

Beef Cattle.—There are now 39 head of pure-bred Aberdeen Angus cattle at this Station. Some excellent bulls sired by "Elm Park Wizard" and "Edward of Glenearnock" have been raised during the year, and disposed of at profitable prices, while for our own herd we have two promising young bulls; one out of an imported cow, "Norma Gordon of Glen Logie," and one from "Blackbird McHenry 83rd." Besides this stock, 9 grade beef cattle are on hand on March 31.

Sheep.—The first year's work with over 400 ewes used in a grading up test by mating to rams of Shropshire, Oxford, Leicester, Cheviot, Hampshire, and Corriedale breeding, has given some interesting results, but it is, of course, too early yet to draw any definite conclusions. 334 lambs averaged 62·5 pounds in weight in the fall of 1918, while the average weight of all grade ewes used in this experiment was 111·9 pounds. They came through the winter in splendid condition, having been quartered in high board fence corrals and fed a good quality of prairie hay. The cost to carry 450 ewes during the preceding season from November 1st to June 15th was $3.50 per head, when a good quality of prairie hay was fed at $10 per ton, and a small amount of grain at 2 cents per pound. The following table gives a financial summary of the results secured with our flock of sheep:—

October, 1917—		
Total cost of 450 ewes	$ 6,750 00	
Total cost of 14 rams	1,000 00	
Total cost of 9,450 pounds grain	189 00	
Cost of 143 tons 300 pounds hay	1,431 50	
Cost of shearing	86 18	
Cost of pasture	60 50	
Returns—		
Sale of wool	.....	$ 2,136 39
420 ewes value November 1, 1918	.....	6,720 00
334 lambs value November 1, 1918	.....	3,340 00
13 rams value November 1, 1918	.....	910 00
Profit	$ 3,579 21	
	$13,096 39	$13,096 39

Swine.—The cost of gains of Berkshire, Yorkshire, and Duroc-Jersey hogs is again available for report and this year favour the Berkshires. However, the results of three years' work show the number of pounds of grain required to make one pound of pork on the different breeds as follows:—

Yorkshire	4 09
Duroc-Jersey	4 69
Berkshire	4 71

The dressing percentage of the various breeds for the past two seasons show them to stand in the same order. Further work will be continued along this line before definite conclusions are drawn.

The general pasture experiments with hogs failed to show the usual advantages of using pasture, no doubt due to the poor growth of forage crops as a result of the dry season. Oats and barley, of the cereals, again took premier place and are to be recommended for districts where this class of pasture is used. From results obtained, it can safely be said that rape is bound to continue as one of the standard pastures for hogs. Self-feeders have been used to good advantage, and are to be recommended, especially where hogs are fed in large numbers. Over six hundred hogs were used in securing data through the above experiments. This number does not include 66 breeding sows and 4 boars which are on hand at the end of the fiscal year.

Poultry.—The poultry at Lacombe now consists of 110 Barred Rocks, 176 White Wyandottes, 99 Rhode Island Reds, 4 Toulouse and 4 African geese, 8 Mammoth Bronze turkeys, and 4 Pekin ducks. Trapnesting has been continued and has proved of great value in selecting the best egg producers. Sixteen hundred and thirty-one dozen eggs were laid during the year at an average feed cost, taken on all mature birds, of 35·7 cents per dozen, while the average price received was 54·2 cents per dozen. The feed cost of raising chickens from hatching until November 1st was 35·66 cents each, while the cost per pound was 8·655 cents. Over 150 breeding cockerels were carried during the winter at a cost of 12·6 cents each per month for feed. A large number of these were sold at reasonable prices to farmers in Central Alberta.

BEES.

No losses of colonies occurred during the winter of 1917-18. The four colonies were increased to seven, and during the summer a yield of over 95 pounds extracted honey each was secured from three of the hives. From the seven hives a total yield of 339·5 pounds extracted honey was obtained. This honey, together with the increase in colonies, gives a return of over 300 per cent on the money invested, no account being taken of labour.

FIELD HUSBANDRY.

The work on the main farm rotation and on rotations "C," "O," and "K" was continued throughout the season. Owing to dry weather, the yields were not as high in some cases as usual. The highest return per acre was secured from oats and peas, seeded at the rate of 2 bushels of oats and 1 bushel of peas per acre, and used for ensilage and fodder. The fact that this ensilage reduces the cost of a pound of butter 20 per cent and is thoroughly suited to feeding beef cattle, is a further inducement for its more general cultivation. On various rotations the cost of producing a bushel of wheat varied from 33·43 cents to $1.81 as a result of the different methods of cultivation and crop rotation.

Cultural Experiments.—The new method adopted of seeding the paths between the plots in all cultural experiments appears to make for more uniformity than formerly. The results of 1917 are further substantiated by the average of seven years, and may be expressed briefly as follows:—

1st. Single ploughing of land for summer fallow, gives better yields of grain on better standing straw than double ploughing, and it is advisable to do this in May or early in June.

2nd. Ploughing from 6 to 8 inches deep gave the maximum yield on stubble land, while on sod the greatest depth tried, namely 5 inches, gave the best returns.

3rd. Fall ploughing of land without burning off the stubble is to be recommended.

4th. Early breaking of sod land yields best, especially if well cultivated.

5th. The use of a nurse crop is recommended in seeding grass seeds and clovers in this district, especially if the land has been in roots or summer fallow the previous year.

6th. The application of barnyard manure to roots and grain has again proved valuable, and most so when worked into the land shortly after applying. The seven year average shows an increased yield of four bushels and two pounds of wheat, or nine bushels and five pounds of oats, or ten bushels and thirty-four pounds of barley per acre, to result from the application of 12 tons of manure.

CEREALS.

Eighteen varieties of spring wheat were tested in duplicate plots. Red Bobs, a selection of Bobs, gave the highest yield in 1918, viz., 53 bushels and 20 pounds. Marquis continued to yield well and is to be recommended for districts not subject to early frost. Ruby, Ottawa 623, ripened thirteen days earlier than Marquis, and yielded scarcely two bushels per acre less than that variety. This wheat is certainly to be recommended for districts liable to early frosts. Several new selections of wheat yielded well, and will no doubt be of value in Central Alberta. Banner topped the list of the twelve varieties of oats tested, by yielding 130 bushels per acre. The new hulless oat, Liberty, Ottawa 480, yielded 81 bushels and 26 pounds per acre, and will no doubt be of value to poultrymen and others who have use for and oat that threshes free from hull. Barks barley again took premier place as a yielder with 111 bushels and 12 pounds per acre. Of the other six-rowed sorts, O.A.C. 21 and Manchurian also yielded well, while Gold and Duckbill, Ottawa 57, of the two-rowed varieties yielded over 100 bushels per acre.

FORAGE PLANTS.

Owing to the scarcity of labour and suitable seed, no experiments were conducted with corn or roots.

Grasses and Clovers.—Fifty-eight grass plots seeded in 1917 gave very good returns of hay this year. While it is too early to draw definite conclusions yet, we found the best yields of hay this year from plots seeded down to mixtures, consisting largely of alsike clover, timothy, and Western Rye grass. Brome grass also yielded well, but has the disadvantage of being hard to hold in check. While mixtures containing Kentucky Blue grass when cut for hay failed to compare well with other varieties, we look forward to more general use of this grass as a permanent pasture.

HORTICULTURE.

Fruits.—Although some apple blossoms suffered from spring frosts, and the trees did not all come through the severe winter unscathed, some fruit was obtained, making this the sixth successive fruiting season. Young trees of Antonovka, Don, Blush Colville, Charles, and Jewel, varieties of cross-bred apples, came through in good shape, and will be used for further planting out in the orchard. Seedlings of Manitoba plum wintered well and blossomed for the first time. Small fruits were again very successful despite the dry weather and splendid yields of strawberries and raspberries were obtained. Senator Dunlap and August Luther strawberries, and Sunbeam, Cuthbert, Herbert and Sarah raspberries were the leading varieties. Gooseberries yielded fairly well, the Houghton variety heading the list.

Vegetables.—Vegetables on the whole made a good showing. Both variety and cultural tests were carried out successfully. No special work was done with potatoes, other than propagation and variety tests. In controlling scab a solution of bichloride of mercury was found to be superior to formalin.

Trees, shrubs, and flowers.—A good showing of annual and perennial flowers was made in the border. Most of the trees and shrubs came through the winter in good shape, although Spirea Van Houttei had to be covered lightly with manure for

protection. All varieties of Caranaga, Lonicera Tartarica, and Syringa Villosa, flowered very freely in their due season. Owing to the lack of rain the lawns were not as green as usual, but the hedges made a good showing and were much admired by visitors.

MEETINGS.

The superintendent addressed the meeting of the milk producers at Calgary, the live stock conference at Ottawa, the Alberta Holstein Breeders Association at Edmonton, and the Alberta Dairy Convention at Calgary, while he acted as judge of dairy cattle at Edmonton and Brandon, and swine at Calgary and Red Deer exhibitions.

EXPERIMENTAL STATION, SUMMERLAND, B.C.

REPORT OF THE SUPERINTENDENT, R. H. HELMER.

THE SEASON.

The past year has been the driest in the recorded history of this district. There was a water shortage in the hills, dams did not fill as well as they should have done, and during July matters were quite serious in some districts. The situation to a great extent was saved by the rains in August. Dry farmers from Kamloops to the boundary were saved by this rain. In some cases, wheat and oats had not germinated at all and when the rain came a crop grew and was harvested for hay. At the Provincial Seed Fair, in previous years, the Rose Hill district near Kamloops always carried away the prizes for wheat and oats; this year there were very few exhibits from this district. July was the hottest month, the mean temperatures being maximum 79·19, minimum 58·19; the hottest day of the year was July 17 when the temperature reached 100 degrees in the shade. The lowest temperature reached during the winter 1918-19 was 3 degrees above on February 24. Very little snow fell during the early part of the winter; there was a good fall during late February and early March.

METEOROLOGICAL RECORDS.

Month.	Temperatures.			Rain.	Snow.	Sunshine.
	Maximum.	Minimum.	Mean.			
1918.	°	°	°	Inches.	Inches.	Hours.
April	81·00	25·00	48·48	0·08	.....	250·1
May	79·00	31·00	54·22	0·28	.....	204·9
June	94·00	37·00	65·16	0·19	.....	291·2
July	100·00	48·00	68·69	1·16	.....	234·2
August	88·00	44·00	64·73	1·62	.....	236·6
September	83·00	43·00	63·34	0·22	.....	270·3
October	68·00	34·00	51·01	0·94	.....	111·2
November	58·00	19·00	38·44	0·90	1·10	63·4
December	48·00	16·00	31·64	0·16	4·40	46·9
1919.						
January	47·00	11·00	31·01	0·29	5·30	58·1
February	43·00	3·00	28·30	0·08	10·80	73·4
March	61·00	8·00	35·70	0·06	8·10	141·3
Totals	.....	.....	.....	5·98	29·70	1,981·6

LIVE STOCK.

Horses.—There are seven horses on this Station, three work teams and one driver. All are in good condition.

Cattle.—The total number of cattle (beef) is 53. During the winter we carried out feeding experiments on 40 steers and 14 cows. Generally these made very good gains, but owing to the high price of feed, the margin of profit was only small.

Sheep.—We have a flock of 35 sheep, pure-bred Cheviots and grade Oxford-Shropshires. These have only done fairly well; our range is very limited and the ewes have not been able to get sufficient exercise. Goitre has been very bad in the lambs and we lost no less than eight from this trouble. In an endeavour to overcome this we have this year fed potassium iodide, 2 grains per ewe per day for four weeks before lambing.

Swine.—We have 25 head of swine. Six of these are brood sows; the three younger ones were sent to Kelowna to be bred to a championship boar. During the summer the pigs were pastured on alfalfa in one of the orchards and fed grain from a self-feeder, others were tried with no grain but subsequently some grain had to be fed to keep the young stock growing. During the winter they have been housed in portable houses and the sows will farrow in these cabins. They are comfortable and all pigs have done well.

POULTRY.

The laying stock consists of 108 White Wyandottes, 48 hens and 60 pullets, with 10 adult males; 9 Bronze turkeys, 4 Pekin ducks and 4 Indian Runner ducks. Two incubators were run during the season with a total of 1,221 eggs, 779 of which were fertile, out of which we got 406 chicks. The 50 pullets which were bought in the winter of 1917-18 laid, during the year ending December 31st, an average of 151·74 eggs each. This year all the pullets will be trap-nested in an endeavour to build up a strain of heavy layers.

BEES.

Of the five colonies put away in the fall of 1917 four came out in good condition, one having died during the winter. These did well, the average weight of honey produced per colony being 96¾ pounds, value $16.68. They were prevented from swarming, one nucleus being taken which built up to a strong colony ready to go into the winter.

FIELD HUSBANDRY.

The hay crops were greatly reduced by the seed production work. In connection with alfalfa records are now available of amounts of water in relation to yields and indicate a greatly increased tonnage with increased amounts of water. Again, it has been found that alfalfa sown without a nurse crop pays in this district. Two fields of alfalfa were sown on the same day, one with a nurse crop of one bushel of oats per acre and one without nurse crop. When the oats were cut we found a very patchy stand of alfalfa which will have to be re-seeded this year. On the other field as soon as the alfalfa and weeds were nine inches high the mower was put over it and the tops were allowed to lie. In September a good crop of alfalfa was cut from this field. On the sandy land nearer the lake the stand of alfalfa has improved but is not very good yet. With scarcity of water, this area does not get its share as it is felt that the available water can be used to better advantage on lands that will produce better crops.

CEREALS.

In the cereal plot six varieties of wheat were tested, four of barley and four of oats, in quadruplicate plots, the highest yields being given by Huron wheat, 32 bushels 20 pounds per acre, Manchurian barley, 41 bushels 32 pounds per acre, and Victory

oats, 62 bushels 12 pounds per acre. We also had plots of flax and peas but owing to the shortage of irrigation water these were practically a failure, and the peas were also very badly affected with mildew and weevil.

Owing to the very dry weather, the plots on the dry farm were a complete failure. The seed germinated well and made good growth early in the season but by the time the rains came the plots were completely dried out.

FORAGE PLANTS.

The most important work in this branch was the emergency carrot and mangel seed growing. Carrot seed was grown on six acres (three acres of which was very poor soil) with an average yield of 666 pounds of finished seed per acre, and four acres of mangel seed, yielding 1,844 pounds of finished seed per acre. About twenty acres of stecklings were grown. Mangels came up well and were harvested the middle of October; carrots had to be sown three times, as the seed would not germinate well and many of the stecklings were too small to be of any use. The changeable weather during the winter was very hard on pitted roots.

In forage crop work we are now on a four-year rotation, two acres being devoted to each year. On the land on which we grew the mangels a "length of run of irrigation water" test on Yellow and Red mangels was conducted. Every twenty feet of mangels from the flume was harvested separately and weighed and the result showed a wonderful uniformity of irrigation. The difference between these varieties of mangels was not nearly so great as is usually found.

In the test plots of forage grasses, all did well with the exception of Kentucky Blue grass, which, although seeded twice, failed to grow.

HORTICULTURE.

Fruits.—The apple trees continue to make good growth and there is beginning to be a marked difference in some of the orchards under the various treatments. This year, the trees in the soiling crop orchard have made the most vigorous growth, outstripping those in the orchard under clean cultivation, although these are a good second. The orchard under a farm rotation shows a marked improvement, and this soil which was the poorest of any of the orchards is rapidly improving under this method of treatment. Again, the alfalfa orchard has made the least progress and there would appear to be no doubt that alfalfa in an orchard is detrimental to the growth of young trees. Pear trees have done better this year; cherries, plums, peaches and apricots have all made good growth and on the two latter fruit is expected this next season.

Vegetables.—A great many of the variety tests of vegetables this year had to be omitted to make room for plots for seed production. For this purpose, plots of the following vegetables were grown:—

Beets, cabbage, carrot, celery, cucumber, egg plant, lettuce, musk melon, water melons, onions, peppers, radish, spinach, squash, tomatoes and peas. The egg plants produced no seed, musk melons were very mixed, water melon seed did not mature, spinach was very poor, radish was scattered by a very high wind and the yield gathered was low, peas were almost a total failure owing to mildew.

Ornamental Gardening.—We had an excellent display of flowers. The bulbs were good, also the annuals, and the perennial border for a long time during the summer was a blaze of colour.

FERTILIZER EXPERIMENTS.

The three-year experiment with commercial fertilizer alone and in combination with barnyard manure, which was started in 1917, was continued this year with oats

seeded to clover. Owing to the length of run of water no results were obtained and the clover came up very patchy. It has been found advisable to have a separate flume for each range of plots with a measuring box for each set of flumes and these will be installed this spring. One feature was very evident, that too much manure can be put on the land when water is scarce. On three plots with barnyard manure at the rate of 10, 15 and 20 tons per acre, the returns were in favour of the least amount in each case. The fertilizer work will be abandoned on this land till 1920. In the meantime some fertilizer work will be carried on with seed plants such as mangel and carrot.

BUILDINGS AND IMPROVEMENTS.

New flumes have been built in several places where these were required, also several lengths of portable fluming. Four colony houses for chickens have been built and two shells of poultry houses which are being temporarily used as houses for two of our teamsters. Eight hog cabins have been built and a permanent root cellar. This latter will be used principally for storing stecklings of mangels and carrots for seed production and it has been fitted up with bins for this purpose. The size is 24 x 48 feet. Our new office building and the poultry administration building, which were finished in the spring of 1918, have been painted. The roads on the Station have been improved in many places by grading and shaling.

EXHIBITIONS AND MEETINGS ATTENDED.

This Station had an exhibit at the following fairs: Kelowna, Armstrong, Naramata, Summerland and the Provincial Seed Fair held at Kelowna in January. At all of these fairs seeds and seed production were made the special features and the exhibit put up aroused a good deal of interest. The Superintendent attended the irrigation Convention held at Nelson; Farmers' Institute meetings at Summerland, Naramata, Peachland, Kelowna and Keremeos and meetings connected with the British Columbia Seed Growers' Association at Kelowna, Armstrong, Penticton and Grand Forks.

VISITORS.

There has again been an increased number of visitors to the Station this year. The Kelowna Farmers' Institute paid their annual visit and numerous parties have been shown over the Station.

EXPERIMENTAL STATION, INVERMERE, B.C.

REPORT OF THE SUPERINTENDENT, G. E. PARHAM.

THE SEASON.

Weather conditions at the commencement of the fiscal year 1918-1919 were exceptionally favourable for spring work.

There was an abundance of moisture in the soil, due to the gradual melting of the winter's snows, which had fallen to the depth of 39·6 inches. With little or no frost in the ground, this moisture was readily absorbed, and the establishment of an ideal seed-bed was rendered possible.

The sowing of the varietal and cultural test plots in the horticultural division was completed by April 20th, and a number of plots were laid out and sown for vegetable seed production.

Seeding of all grain and rotation crops was commenced about the same date and was completed during the first week of May. Dry weather supervened, the total

precipitation for the three spring months amounting to only 1·63 inches; bright sunshine, averaging nearly 9 hours a day, was recorded during the same period, with the maximum temperature reading of 90°, on June 12th.

On the dry-farming section, crops which, during the early part of the season, had kept pace with those on the irrigated plots, began to fall behind, and, the drought continuing, were practically burnt up. The wheat was a failure, no grain maturing. Swiss chard, however, made persistent growth throughout the season, though the final yield was not considerable.

On the irrigated sections some exceptionally heavy crops were grown, particularly of clover, alfalfa, peas and potatoes, and of alfalfa and clover sown with various grass mixtures.

Similar comparisons were reported by farmers in the district, the yields from irrigated crops being exceptionally high, while those from areas dependent on natural precipitation were practically negligible.

Haying was completed under ideal conditions, and early in August the drought at length lifted, and the crops were greatly benefited by the generous rains which followed.

The improvement was very noticeable on the benches and range pastures, which took on a new lease of life and made a considerable second growth, materially bettering the prospects for horses to be later wintered in the open.

Weather conditions during the fall were favourable for the harvesting of the grain, potato forage and root crops.

Open weather continuing throughout November, it was possible to complete fall-ploughing during that month.

Except for a slight fall on the 25th November, there was no snow prior to December 3rd, when 10 inches were recorded, and an usually mild winter set in.

The mean temperature for the three months—December, January and February—was 18·9°, as compared with 13·9°, the average for the four preceding years.

Though there were several falls of snow during the winter, Chinook winds, invariably accompanied by a rise in temperature, swept the lower levels of the valley, including the Experimental Station, practically bare of snow, on three occasions: the bench lands, however, and the less exposed areas retained a substantial covering until the last week of March.

Sleighing commenced on the 4th December, and continued until the 15th March.

METEOROLOGICAL OBSERVATIONS.

The following tables summarise the temperature, rainfall, snowfall and sunshine readings for the twelve months under review, together with those of the four preceeding years:—

TABLE SHOWING MEAN TEMPERATURES.

Dominion Experimental Station, Invermere, B.C.

Month.	1914.			1915.			1916.			1917.			1918.		
	Mean max.	Mean min.	True mean.	Mean max.	Mean min.	True mean.	Mean max.	Mean min.	True mean.	Mean max.	Mean min.	True mean.	Mean max.	Mean min.	True mean.
April	55·46	32·23	43·84	61·83	32·20	47·01	55·10	29·50	42·30	49·06	26·80	37·93	56·53	27·17	41·85
May	65·83	38·13	51·98	63·31	40·83	52·07	57·90	35·20	46·55	63·50	37·00	50·25	60·87	31·65	47·76
June	68·33	45·50	56·91	68·43	44·00	56·21	68·60	43·30	55·95	66·60	41·00	53·80	74·03	43·13	58·58
July	81·29	47·67	64·48	71·83	48·77	60·30	81·29	47·67	64·48	81·50	47·40	64·40	77·81	47·93	62·87
August	78·32	43·12	60·72	81·90	48·25	65·07	75·00	43·90	59·45	76·40	44·30	60·30	71·16	45·61	* 58·38
September	61·86	37·70	49·78	62·62	36·40	49·51	63·76	35·56	49·66	65·03	38·23	51·63	71·40	39·16	55·28
October	49·87	33·67	41·77	53·83	34·00	43·91	50·50	27·90	39·20	53·20	27·80	40·50	52·20	34·20	43·20
November	37·50	23·86	30·68	32·00	16·66	24·33	31·70	12·40	22·05	36·70	27·30	32·05	36·40	21·27	28·83
December	19·74	3·67	11·70	29·58	12·67	21·12	14·00	3·90	5·05	23·50	7·50	15·50	27·26	12·87	20·06
	1915.			1916.			1917.			1918.			1919.		
January	22·45	3·80	13·12	4·83	14·41	4·79	21·80	2·90	12·35	22·80	6·70	14·70	28·29	11·23	19·76
February	36·00	15·46	25·73	28·40	6·60	17·50	25·60	3·00	14·30	23·90	3·14	13·52	26·82	7·14	17·00
March	42·67	23·58	33·12	42·90	22·90	32·90	35·70	9·10	22·40	42·00	19·00	30·50	40·10	16·13	28·11
Means 12 months	51·61	29·03	40·32	50·12	27·40	39·16	48·41	23·88	36·14	50·35	27·17	38·76	51·91	28·37	40·14

TABLES SHOWING EXTREMES OF TEMPERATURE.

Dominion Experimental Station, Invermere, B.C.

Month.	1914.				1915.				1916.				1917.				1918.			
	Max.		Min.		Max.		Min.		Max.		Min.		Max.		Min.		Max.		Min.	
	Date.	Far.	Date.	Far.	Date	Far.	Date.	Far.	Date	Far.	Date	Far.	Date	Far.	Date	Far.	Date.	Far.	Date.	Far.
		°		°		°		°		°		°		°		°		°		°
April	30	71	1	22	16	75	21	24	26	76	23	21	14	54	1	11	20	72	2	13
May	16	87	6	28	7	78	29	30	4	71	11	26	12	77	1	22	3	76	26	24
June	18	85	6	34	24	82	8	35	18	88	7	34	16	86	13	35	12	90	3	28
July	31	95	16	42	20	83	5	40	31	88	23	39	17	94	31	36	17	94	4	34
August	1	95	31	33	6	89	5	44	27	84	4	37	16	88	31	37	1	89	28	33
September	2	80	30	33	5	80	20	27	1	77	28	24	21	80	31	27	18	80	3	33
October	16	66	22	24	23	65	7	23	16	67	4	20	3	73	28	9	5	62	30	22
November	25	51	15	3	1	49	13	−04	1	47	12	−12	4	50	1	16	14	48	25	2
December	2	35	15	−16	4	40	30	−16	2	39	27	−31	18	44	15	15	7	42	31	−12

	1915.				1916.				1917				1918.				1919.			
January	11	36	21	−15	23	40	12	−34	9	40	31	−25	3	40	31	−32	19	43	1	−10
February	17	44	14	−01	15	48	3	−25	12	44	1	−26	7	46	1	−27	11	42	24	−19
March	21	63	8	12	11	58	5	1	5	42	1	−08	29	62	6	−05	29	61	1	−17

RAIN AND SNOW FALL RECORDS.

Dominion Experimental Station, Invermere, B.C.

Month.	1914.			1915.			1916.			1917.			1918.		
	Rain.	Snow.	Total.	Rain.	Snow.	Total.	Rain.	Snow.	Total.	Rain.	Snow.	Total.	Rain.	Snow.	Total.
	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
April	1·25	....	1·25	1·14	.....	1·14	0·62	.....	0·62	0·18	0·5	0·23	0·38	0·1	0·39
May	1·46	....	1·46	1·01	.....	1·01	2·89	..	2·89	2·85	.....	2·85	0·93	.....	0·93
June	1·59	.....	1·59	3·92	.....	3·92	2·01	.	2·01	1·96	.....	1·96	0·36	.....	0·36
July	1·57	.....	1·57	3·79	.....	3·79	2·32	..	2·32	0·29	.....	0·29	1·32	.....	1·32
August	0·75	.....	0·75	0·67	.....	0·67	2·01	....	2·01	1·20	.....	1·20	3·23	.....	3·23
September	2·16	.....	2·16	0·72	.....	0·72	1·15	.....	1·15	0 75	.....	0·75	0·85	.....	0·85
October	0·77	.....	0·77	0·90	.....	0·90	0·54	.....	0·54	0·19	2·2	0·41	1·12	.....	1·12
November	0·39	4·00	0·79	0·10	8·0	0·90	0·08	2·5	0·33	0·38	.....	0·38	0·48	0·5	0·53
December	.....	4·25	0·42	0·28	3·0	0·58	.. ..	3·0	0·30	0·17	24·2	2·59	0·40	11·4	1·53
	1915.			1916.			1917.			1918.			1919.		
January	....	5·12	0·51	0·01	4·3	0·44	.....	1·5	0·15	1·96	.....	1·96	0·59	3·9	0·98
February	....	3·00	0·30	0·21	10·1	1·22	.....	3·6	0·36	0·06	11·6	1·22	0·03	8·0	0·83
March	0·03	.	0·03	0·33	1·2	0·45	..	1·8	0·18	0·24	1·1	0·35	0·09	5·6	0·65
Totals	9·97	16·37	11·60	13·08	26·6	15·74	11·62	12·4	12·86	10·23	39·6	14·19	9·78	29·5	12·72

SUNSHINE RECORDS.

MONTHLY TOTALS AND RATIO TO POSSIBLE HOURS.—DOMINION EXPERIMENTAL STATION, INVERMERE.

Month.	Possible.	1914.		1915.		1916.		1917.		1918.	
		Total.	Ratio.	Total.	Ratio.	Total.	Ratio.	Total.	Ratio.	Total.	Ratio.
		hrs.		hrs.		hrs.		hrs.		hrs.	
April	414·2	165·1	0·40	208·7	0·47	182·5	0·44	168·9	0·40	261·9	0·63
May	480·8	237·1	0·47	168·0	0·32	179·1	0·37	227·0	0·47	241·0	0·50
June	494·1	198·4	0·40	197·7	0·40	202·0	0·40	230·2	0·46	302·1	0·61
July	497·9	314·5	0·63	211·4	0·42	271·1	0·54	365·1	0·73	304·0	0·59
August	450·7	267·9	0·59	269·9	0·65	269·0	0·60	300·4	0·66	214·0	0·47
September	379·0	148·3	0·39	151·8	0·40	192·2	0·51	142·9	0·38	232·4	0·61
October	329·6	86·7	0·26	124·7	0·37	159·2	0·48	147·2	0·44	125·0	0·38
November	266·1	56·4	0·21	59·0	0·22	84·6	0·31	23·7	0·09	89·9	0·34
December	242·3	86·8	0·36	43·4	0·17	84·4	0·34	38·2	0·15	28·4	0·13
		1915.		1916.		1917.		1918.		1919.	
January	259·2	46·0	0·18	99·0	0·38	80·1	0·30	44·1	0·17	59·6	0·23
February	276·6	70·9	0·25	97·8	0·31	99·8	0·36	80·9	0·29	79·2	0·28
March	366·6	175·8	0·47	131·7	0·35	143·7	0·40	141·7	0·39	167·5	0·46
Totals	4,457·1	1,853·9	0·42	1,763·1	0·40	1,947·7	0·44	1,910·3	0·43	2,105·0	0·47
Total daily average		5·1 hrs.		4·8 hrs.		5·3 hrs.		5·2 hrs.		5·8 hrs.	

LIVE STOCK.

Hogs.—A Berkshire boar is kept at the Station for use by local breeders, and a start at hog raising is now being made by the introduction of a young Berkshire sow obtained from the Experimental Station at Lethbridge.

Cattle.—The herd consists of a registered Shorthorn bull and three Shorthorn cows.

Poultry.—A successful season was experienced in this Division: 200 birds were carried through the winter of 1917-18, and consisted of Barred Plymouth Rocks and White Leghorns. In order to save labour, only one pen, containing 50 Barred Rock pullets, was trap-nested; during the poultry year terminating October 31, 1918, this pen laid 6,876 eggs—an average of 137·5 per bird. The best bird commenced laying December 4, and by October 31 had 205 eggs to her credit.

A record was kept of the amount and value of all feed used in this pen, also of the cost and weight of food required to produce a dozen eggs; it was found that each bird consumed during the 12 months 84½ pounds of food at a cost of $2.95.

The weight of food required to produce a dozen eggs averaged 7¼ pounds throughout the year, and its cost averaged 25·8 cents.

Owing to the restriction placed upon the use of wheat as a poultry food, whole oats was substituted, during the early spring, as a grain ration; the sudden change of diet caused some digestive troubles among the young chickens, and there was some increase in mortality, but no deleterious effects were observed among the mature birds, in fact, during a 31 days' test ending April 17, 47 Barred Rock pullets, fed on whole oats only, as a grain ration, laid a total of 1,187 eggs—an average of 25¼ eggs per bird.

Cost of Raising Chickens.—An experiment to determine the cost of rearing chickens from date of hatching to the age of 10 weeks and 20 weeks was conducted with 50 Barred Rock pullets hatched in April. At 10 weeks old each bird had consumed 5½ pounds of food, at a cost of 16·4 cents, while at 20 weeks old 19¾ pounds of food had been consumed, costing 54·5 cents.

Incubation.—The hatching records for the season were satisfactory: out of a total of 762 eggs set, 600 proved fertile; 59 eggs with dead germs were discarded and of 541 left in, 402 hatched, being 52·7 per cent of the total number set, or 67 per cent of the total of fertile eggs; 23 cripples were killed, and of the 379 chicks transferred to the brooder, 367 were alive July 1.

It was calculated that, for one chick hatched, 1·9 eggs were required, or 1·5 fertile eggs, while 2·1 eggs were needed to produce one chick alive July 1.

Current Poultry Year.—A more extensive programme for the current poultry season has been inaugurated, including records of the cost of production, the fertility, hatchability and livability of eggs and chicks hatched out in the different months.

A record is also being kept of the weight and value of feed used in all pens, the value, at local market prices, of eggs laid, and the profit or loss per pen, over cost of feed; pedigree records will be kept of any birds showing exceptional qualities. A small pen of White Wyandottes was raised from eggs procured from the Experimental Station at Sidney, Vancouver Island: these birds proved exceptional winter layers.

Turkeys.—The flock at the end of the season consisted of 34 birds of the American Bronze variety; of these, the male birds not required for breeding purposes were fattened and killed for the Christmas market.

The breeding birds came through the winter in fine condition with no other shelter than the natural fir trees. Good results were obtained through the use of an incubator for hatching.

BEES.

Of the 14 colonies placed in winter quarters the previous fall, 10 came through in good shape. Experiments in wintering had been continued as in previous years, 8 being placed in the cellar, 2 in the open, protected by double packing cases, lined with moss and shavings, and 4 in a trench dug into a dry sandy knoll, the hives covered with 6 inches of straw and 9 inches of earth.

Of the 4 colonies that succumbed, two were in the cellar, and one each in the trench and in the packing cases; plenty of stores were found in the hives, and it is believed that the losses were attributable to damp.

The total yield of extracted honey produced by the ten colonies was 1,189 pounds, averaging 118·9 pounds per colony, the greatest yield from one hive being 192 pounds.

The honey was sold locally at 30 cents per pound, and the average value of product, that is honey, less cost of sugar fed, was $29.09 per colony, spring count.

One hive was placed upon scales and a daily record of its gain or loss in weight was kept throughout the season, together with daily particulars of temperature, rainfall and other meteorological conditions.

There was no increase in the number of colonies during the year, and no losses through swarming, the tend of the experiments being in the direction of obtaining the maximum honey yield rather than of dividing or adding to the number of colonies.

FIELD HUSBANDRY.

Rotations.—Experiments were continued with rotations of 3, 4 and 5 years' duration in the irrigated sections and with a 6 year rotation under dry-farming methods. The latter, though making a good start early in the season, thanks to an abundance of moisture in the soil from the melting of the winter's snows, failed later from the effects of the drought which continued throughout the growing season and until early in August.

The plots of wheat and barley were burned up before the grain had formed in the ear but Swiss chard, sown as a hoed crop, again showed distinct drought-resisting qualities, and its value as a forage plant for the dry farm.

Under the 4-year rotation, consisting of hoed crop, wheat, peas, oats, a heavy yield of peas was obtained from the variety Prussian Blue, this plot threshing out at the rate of 29 bushels 22 pounds to the acre. The repeated successes obtained at this Station with field peas, and the entire absence, so far, of weevil or disease would seem to demonstrate the suitability of this district for that plant.

Under the same rotation, half an acre of mangels yielded at the rate of 17¼ tons per acre; the plot received two dressings of poisoned bran, and the ravages of the cutworm, which had practically destroyed the mangel crop in 1916 and 1917, were successfully checked.

In the 5-year rotation, a plot consisting of four varieties of swede turnip produced 27½ tons per acre.

In the 3-year rotation consisting of oats seeded down to clover-clover-potatoes, the latter yielded at the rate of 17½ tons per acre, of which 93 per cent were marketable; two heavy cuts were taken from the adjoining plot of clover.

Though it is early, as yet, to draw any definite conclusions as to the relative merits of these rotations, the experiments indicate the importance of growing clover in the year preceding a potato crop, and the advantage of ploughing under a pea crop as a means of adding humus to the soil.

ALFALFA.

The advantage of sowing alfalfa as a permanent crop on new land in this district has been clearly demonstrated during the last three years at the Station.

It has so far never suffered from winter-killing, although Red clover, under the same conditions, has been repeatedly killed out where the plant has lost the protection of the snow blanket, through "Chinook" winds and other causes.

An Alfalfa Crop Competition conducted under the auspices of the Windermere District Agricultural Association, and judged by the Superintendent, brought to light some very fine stands of alfalfa, and it would appear that the district is eminently suited to this plant; two cuttings in the year may always be reckoned upon, and occasionally three.

With a view to testing the comparative effect of winter conditions on alfalfa as the result of late cropping or of pasturing late in the fall, a third crop was taken from a part of a three-acre field at the Station: this will be compared as to vitality and yield with the rest of the plot, which was left standing with a considerable third growth, as protection for the winter.

IRRIGATION WATER RECORD.

A record has been kept for the past five years of the amount of water used for irrigation, together with the number of acre-inches on certain crops; the area selected comprised the 4-year rotation, half an acre of each of roots, wheat, peas and oats.

The following table records the figures for the past five years, and compares the amount of water needed for irrigation on the different crops during the four growing months—April, May, June and July—with the natural rainfall during the same period.

With an average precipitation for the four months of 6·38 inches, roots averaged an annual supply of 8·09 acre-inches of water, wheat averaged 6·35 acre-inches, peas 8 acre-inches and oats 5·63 acre-inches, while the whole field received an average supply of 7·03 acre-inches annually.

Irrigation Chart—4-year Rotation.

——	Total precipitation for year.	Total precipitation 4 months. April–July.	Acre-inches used on roots.	Acre-inches used on wheat.	Acre-inches used on peas.	Acre-inches used on oats.	Total for year.
1914	12·91	5·87	12·78	9·27	11·40	5·89	9·83
1915	14·47	9·86	2·03	5·04	5·84	6·73	4·91
1916	14·28	7·84	1·62	Nil.	3·52	Nil.	1·31
1917	11·70	5·33	5·75	7·55	9·69	4·14	6·78
1918	13·79	3·00	18·30	9·91	9·57	11·38	12·29
Average amount of water used per acre, in acre-inches			8·09	6·35	8·00	5·63	7·02

FORAGE CROPS.

Clover and Alfalfa with Grass Mixtures.—An experiment was inaugurated in 1917 to compare the results of various mixtures of grasses sown with Red clover, with similar mixtures of grasses sown with alfalfa for hay. The 14 plots were seeded June 15, 1917 without a nurse-crop, and a good stand was obtained throughout the whole area. No crop was taken the first year, but the mower was run over the plots once, leaving a few inches of growth to carry the plant over the winter.

In the season now under review the plots were irrigated May 18 and 19, June 22-24, July 9-10, and again on September 12-13, after the second crop had been carried. The first cutting was taken on July 5; a second cutting of the clover and clover mix-

tures on September 5, and of alfalfa and alfalfa mixtures a few days earlier. The total yields from the different plots are given in the following table:—

SECTION E.
Alfalfa and Grass Mixtures.

Plot No.	Mixture.	Wt. seed sown per acre.	Total yield hay per acre. (2 cuts).
		Lbs.	Tons.
1	Alfalfa	10	4·6
	Timothy	8	
2	Alfalfa	10	
	Western Rye	10	4·62
3	Alfalfa	10	
	Meadow Fescue	15	5·00
4	Alfalfa	10	
	Orchard Grass	15	4·65
5	Alfalfa	10	
	Tall Oat Grass	15	3·6
6	Alfalfa	10	
	Timothy	2	
	Western Rye	3	
	Meadow Fescue	3½	
	Orchard Grass	3½	
	Tall Oat Grass	3½	5·16
7	Alfalfa alone	12	4·41

SECTION F.
Red Clover and Grass Mixtures.

Plot No.	Mixture.	Wt. seed. sown per acre.	Total yield hay per acre (2 cuts).
		Lbs.	Tons.
1	Red Clover	10	5·13
	Timothy	8	
2	Red Clover	10	
	Western Rye	10	6·88
3	Red Clover	10	
	Meadow Fescue	15	6·9
4	Red Clover	10	
	Orchard Grass	15	6·12
5	Red Clover	10	
	Tall Oat Grass	15	5·91
6	Red Clover	10	
	Timothy	2	
	Western Rye	3	
	Meadow Fescue	3½	
	Orchard Grass	3½	
	Tall Oat Grass	3½	6·63
7	Red Clover alone	12	5·94

The above plots measure 1-30th acre and as yet no manure has been applied. This test is being continued with a view to ascertaining the advisability of adding grasses when seeding down land with clover or alfalfa for permanent or temporary pasture.

Soiling Crops.—Experiments were continued to determine the most suitable crops for soiling purposes; plots of rape, Thousand-headed kale, and Swiss chard yielded heavily, as in the previous season, and in the order named. One cutting only was taken, being fed green to the cattle; Swiss chard proved at first the least palatable, until the taste for it had been acquired.

ROOTS.

Swede Turnips.—Half an acre of swedes were sown, the test being limited to four varieties, which yielded at the following rates per acre:—

Good Luck, 21·72 tons, Magnum Bonum, 27·31 tons; Invicta, 30·6 tons; Cornings Lapland, 31·48 tons.

Mangels.—The ravages of the cutworm being successfully controlled by the application of two dressings of poisoned bran, some satisfactory yields were obtained. The total from the half-acre plot was at the rate of 17 tons 464 pounds per acre, the best result was from Yellow Intermediate, yielding 20·37 tons per acre, followed by Half Sugar White, with 17·42 tons and Mammoth Long Red with 14·25 tons per acre.

This crop was sown in the 4-year rotation: roots, peas, oats, roots.

Sugar Beet.—Four varieties of sugar beet were grown, giving yields per acre as follows:—

Vilmorin Improved, 13·8 tons; Canada Grown, 15·8 tons; Russian Grown, 19·8 tons; Wanzleben, 17 tons.

Carrots.—Three varieties of carrots were tested on land which had received no manure or fertilizers; it had, however been dressed heavily with farm manure for the previous crop of field corn. The highest producer was White Belgian which yielded at the rate of 29·15 tons per acre, the next in order being Improved Short White with 26·3 tons, followed by Danish Champion (a red variety), with a yield of 19·7 tons.

CORN.

The test of field corn was limited to two varieties, which were sown May 13. A night frost on June 1st, when a temperature of 28 degrees was recorded, thinned out the plants, but not sufficiently to render re-sowing necessary.

There was considerable growth, and the plant yielded well as fodder, showing one or two cobs on 75 per cent of the stalks, but the season was not sufficiently long to ripen the cobs.

CEREALS.

Variety tests were continued with wheat, barley, oats, and peas, on a five-year rotation, the aim of which is to supply humus to the soil by alternating crops of legumes with cereals.

The system of the rotation is as follows: First year—peas, ploughed under for humus; second year—cereal, seeded down with clover; third year—clover (second crop ploughed under when ready for cutting); fourth year—peas, for seed; fifth year—cereal.

Duplicate one-fortieth-acre plots are sown, totalling one-twentieth acre to each variety. Samples of all grains are forwarded to Ottawa for further tests of germination and milling qualities. The Dominion Cerealist has on many occasions remarked on the good yields and the high quality of grain, and has expressed the opinion that the soil and the climatic conditions in this district are particularly favourable for the growing of peas.

The following table gives the yields per acre obtained from the different varieties during the past four seasons:—

CEREAL VARIETY TEST—YIELDS PER ACRE.

Name of Variety.	1915.		1916.		1917.		1918.	
	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
Wheat—								
Huron	22	22	38	00	27	40	12	30
Marquis	23	40	34	40	24	20	24	40
Pioneer	22	40	22	20	23	20	24	40
Barley—								
Manchurian	25	00	32	44	18	00	16	20
Success	16	42	15	20	15	40	11	20
Chevalier	40	00	60	00	23	36	23	46
Gold	24	08	86	00	45	20	30	20
Oats—								
Banner	38	08	125	10	30	40	24	38
Danbenay	35	00	64	24	24	28	17	24
Victory	32	07	89	14	36	32	33	36
Peas—								
Arthur			36	40	44	40	30	00
Chancellor			43	00	45	00	23	40
Golden Vine			29	00	48	00	20	60
Prussian Blue			27	00	55	40	23	20
Solo			27	40	47	40	30	10

Figures for the pea crop in 1915 are not available, through a sudden windstorm so entangling the different varieties while they were ripening in windrows, that it was impossible to determine the relative yields.

An experimental plot of one-fortieth-acre was sown with the new Liberty Hulless oat and yielded 980 pounds of grain to the acre. Further tests will be made with this interesting variety.

HORTICULTURE.

The work in this Division was considerably curtailed owing to war conditions, the variety tests for vegetables, other than potatoes, being practically suspended: experiments in various cultural methods were, however, carried out as in previous years.

Seed Production.—To test the suitability of the district for seed production, small plots were sown with beet, carrot, parsnip, radish, lettuce, spinach and cabbage. In the case of roots, the stecklings were stored during the winter, and will be planted out in prepared ground in the spring.

Potatoes—Variety Test.—This test was continued with 45 varieties. The yields throughout were considerably in excess of the average and the proportion of marketable tubers was greater.

Potatoes—Irrigation Test.—The object of this experiment is to note the comparative effect upon the yield of potatoes of one irrigation during the season, two or more irrigations during the season, and no irrigation. The rows are 100 feet long by 2½ feet and the seed is dropped 12 inches apart.

The following table gives the comparative yields for the past four years.

Potatoes—Irrigation Test—Yields per 100-foot-row.

The varieties used are Sir Walter Raleigh, Wee McGregor and Conquering Hero. Plots received one dressing of farm manure.

	Plot A. No Irrigation.			Plot B. One Irrigation.			Plot C. Two or more Irrigations.		
	Sir W. Raleigh.	Wee McGregor.	Conquering Hero.	Sir W. Raleigh.	Wee McGregor.	Conquering Hero.	Sir W. Raleigh.	Wee McGregor.	Conquering Hero.
1915.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Marketable	150	115	136	144	185	176	155	179	120
Unmarketable	54	64	60	63	80	83	45	81	68
Total	204	179	196	207	265	259	200	260	188
Total plot yield		579 lbs.			731			648	
1916									
Marketable	120	85	136	120	88	148	119	118	132
Unmarketable	47	32	36	48	36	45	55	34	55
Total	167	117	172	168	124	193	174	152	187
Total plot yield		456 lbs.			485			513	
1917.									
Marketable	91	73	89	88	81	101	88	68	94
Unmarketable	20	19	28	22	24	23	26	21	25
Total	111	92	117	110	105	124	114	89	119
Total plot yield		320 lbs.			339			322	
1918									
Marketable	203	221	180	191	199	230	200	203	125
Unmarketable	36	22	22	20	22	25	23	21	21
Total	239	243	202	211	221	255	223	224	246
Total plot yield		682 lbs.			687			593	

The result of this test seems to point to the possibility of growing potatoes in this district without irrigation, provided the land is supplied with humus in the form of manure or of a crop ploughed under. The average yield from Plot B was 20 per cent higher than from Plot A, and further experiments may determine the amount of water it will be most profitable to apply.

EXHIBITIONS.

The following fall fairs were attended: Invermere, Traill, Nelson, Creston and Nakusp. That the visits were appreciated at all points was evident, and the value of this work as a means of bringing the farmers into touch with the work of the Experimental Farms was again demonstrated.

MEETINGS ATTENDED.

In addition to being present at the above Fairs, and assisting in the judging at Creston and Nakusp, the Superintendent attended the following meetings and Conventions:—

District Farmers' Institute meeting at Cranbrook, the B.C. Seedgrowers Association and the Dairymen's Convention at Kelowna, the B.C. Fruitgrowers Association at Penticton, and the various meetings of the local Agricultural Association and Stockbreeders Association.

The Superintendent gave addresses at Nakusp and Cranbrook, and read a paper before the Annual Convention of the Western Canada Irrigation Association, held at Nelson.

NEW LAND AND DEVELOPMENTS.

In addition to the adjoining land acquired in 1917, of which approximately 10 acres have been broken and put under crop, a further plot of 2½ acres, with a house and small barn, has been added to the Station holdings.

A quantity of manure has been bought from a local livery stable, and has been applied to the new land during the winter, and shale, for the improvement of the roads and drives at the Station, has been hauled.

EXPERIMENTAL FARM, AGASSIZ, B.C.

REPORT OF THE OFFICER-IN-CHARGE, W. H. HICKS, B.S.A.

THE SEASON.

The total precipitation of 78·6 inches for the year 1918-19 was larger than average, being, however, ·67 inches less than for the preceding year. April was the driest on record and afforded ideal conditions for getting the land in good tilth and the crops well sown. May was somewhat too dry and cool. Two degrees of frost were recorded on May 24th which slightly damaged tender garden crops. June was the driest for seven years with a mean temperature the highest for the same period. Conditions were improved somewhat in July but all crops still needed moisture. The following month was the wettest August on record. The large precipitation, along with warm, sultry, calm weather resulted in sprouted and badly discoloured cereal crops. September was the driest month of the year and the driest September for twelve years. Weather conditions were reversed again in October when 14·85 inches of rain fell, which is a record in October for twenty years. The three succeeding months were very wet, while February and March were about normal. The winter although wet was mild with very little snow, except for one storm the latter part of February.

The dry growing season resulted in decreased yields of practically all crops, especially roots, pasture, hay and cereals. The grain crops gave very disappointing yields and were badly weathered by the excessive rains in August. The hay, although light, was of good quality. Potatoes suffered badly from blight and dry rot and, like the root crop, were difficult to harvest in the wet month of October.

METEOROLOGICAL RECORDS.

Month.	Temperature.					Precipitation.			
	Date.	Max.	Date.	Min.	Mean.	Rain.	Snow.	Total	Sunshine
		°		°	°	Inches.	Inches.	Inches.	Hours.
1918.									
April	19	78	4	29	49·58	1·38		1·38	202·4
May	12	75	24	30	52·64	4·64		4·64	160·9
June	20	86	1	39	61·68	1·74		1·74	208·7
July	17	94	13	41	64·2	2·28		2·28	198·6
August	30	86	21	35	62·04	7·94		7·94	180 9
September	27	90	20	39	66·21	0·26		0·26	208·8
October	19	66	23	39	51·09	14·85		14·85	76·6
November	8	52	24	25	42·63	8·46	6	9 06	57·6
December	4	50	31	24	38·95	12·59	8	13·39	56 0
1919.									
January	13	49	1	20	38·58	11·01		11·01	53 3
February	18	49	24	16	37·3	3·58	34	6·98	57·1
March	31	78	1	15	42·48	3·67	14	5·07	120·0

LIVE STOCK.

Horses.—There are on the Agassiz Farm ten work horses and one driver, also two mature Clydesdale mares in foal and three Clydesdale fillies, a three-year-old, two-year-old, and foal. The feed cost of maintaining horses increased greatly during the past year. The average feed cost per hour's work done by the heavy draft horses was 10·4 cents and for the light draft 9·77 cents.

Cattle.—The entire herd numbers eighty head, thirty-nine of them being pure-bred and forty-one grade Holsteins. Although the size of the herd has not increased the quality is much improved. A number of grade cows and heifers were sold to make room for the gradually increasing pure-bred herd. So far none of the latter females has been disposed of. The health of the herd has been good. Two tests for tuberculosis failed to detect a reaction. This makes the sixth successive year of freedom from this disease.

The average milk production for the twenty-nine cows finishing a lactation period during the year is 9,042·19 pounds for an average lactation of 333 days. This is an increase per cow of 669·79 pounds of milk over all previous years. Fifty per cent of the calves dropped by these cows were females. A number of good records were made, the best by the four-year-old cow Agassiz Pietje Korndyke, 6407. She gave 19,935 pounds of milk and 933·75 pounds of butter in 365 days under Record of Performance rules. The mature cow Aurora Mechthilde-9701, tested under the same rules, produced 19,271 pounds of milk and 818·75 pounds of butter in 325 days, and this following a record of 18,195 pounds of milk made last year. A few of the best individuals in the herd were exhibited at the Vancouver Exhibition and did very well in competition with other herds. Aurora Mechthilde won the Grand Championship for dairy females all ages and breeds. Second in the Senior herd class. First and Second for two animals from one dam, and a few other prizes as well were won in the Holstein classes by the herd in strong competitions.

Experimental feeding work with dairy cattle was continued as formerly. More interesting data on the comparative value of pea and oat, clover, and corn silage were secured. In other experiments, mangels produced a slightly cheaper product than carrots, crushed barley proved superior to corn meal, and good pasture gave better results than silage for milk and butter production. The cost of raising and maintaining all dairy animals increased over last year.

The manufacture of cheese followed much the same course as that of last year, namely, a regular weekly shipment of cream cheese to Vancouver and a more inter-

mittent sale of Stilton and Camembert. During the year 350 pounds of Stilton at 40 cents per pound, 5,597 cream cheeses at 15 cents each, and 291 Camembert at 27 cents each, were sold. Camembert at this price yields a good profit since only five pounds of whole milk goes to the manufacture of each cheese and the labour entailed is small, but the demand for them is not so large nor so steady as for cream cheese. Record of Merit tests of seven and thirty days for seventeen cows of the herd were made. Milk samples have been tested for those farmers who cared to submit them and the regular weekly test for each cow of the herd was continued.

Sheep.—Three rams and forty-four ewes of the Dorset Horned breed, one ram and five ewes of the Oxford Down breed, thirty-one grade ewes, and sixty-six spring lambs form the present flock. The sixty-six lambs are being raised by the forty-eight ewes. The entire flock was on pasture until February 23rd and from that date until March 31st the average feed cost per sheep amounted to $3.48.

The 1918 wool clip totalled 518 pounds from 67 sheep, or an average of 7·73 pounds per fleece. It was sold co-operatively through the Vancouver Island Flockmasters' Association. All fleeces were top grade and brought 61 cents per pound net.

No fall lambs were raised this year but a Dorset ram lamb was born on January 6th and an Oxford on the 16th. The cost of feeding the dams and the lambs from then till the end of March amounted to $15.22. The Dorset lamb weighed 76 and the Oxford 70 pounds on March 31st. They were excellent specimens of their respective breeds. Six thrifty February lambs were sold at Easter for $16 each. The sheep grading experiment with the Dorset rams was continued with good results. A similar experiment, using an Oxford ram on the same ewes, was commenced with the intention of securing information on the relative merits of the two breeds for grading purposes.

A few of the best Dorset sheep were exhibited at Vancouver Exhibition and succeeded in winning the major honours in the Dorset classes, including Champion ram and Champion ewe.

Swine.—There are on hand at the end of the year 2 boars, 13 sows, 47 feeders, and 61 sucking pigs, all pure bred Yorkshires. Eighteen sows owned during the year farrowed 26 litters, with a total of 294 pigs, and raised 249 of them, or 84·7 per cent. This makes a total of 9·7 pigs per litter raised, which is an excellent average. Feeding 28 pigs for 110 days, comparing the self-feeder with the trough feeding method indicated greater and cheaper gains made by the trough fed lot, labour not included. In a comparison of barrow versus sow pigs for pork production, the cost of 100 pounds gain was 89 cents less with the barrows than the sow group. The returns from a field of peas harvested by hogs amounted to $20.20 per acre. In comparing barley with Grade A screenings, the latter in one trial produced pork $3.48 and in the other $4.78 per 100 pounds cheaper than the barley. The barley was charged at $60 per ton and the screenings at $45. An attempt was made to arrive at the most economical amount of skim milk to feed young pigs averaging 44 pounds each. Lot 1 was given water, lot 2 four pounds of milk per pig per day, lot 3 six pounds of milk per pig per day, and lot 4 eight pounds per pig per day. All lots were fed what grain they would consume, lot 1 taking the most with a gradual decrease to lot 4. The average daily gain in each group increased as the amount of milk was increased. Charging grain at market price and skim milk at 50 cents per hundred pounds, the lot receiving the 6 pounds of milk per pig per day made the most economical gains.

POULTRY.

The kinds wintered here this season consisted of about 250 Barred Plymouth Rocks, 150 White Leghorns, and 3 White Wyandottes. Some very good winter records were obtained from each of the breeds. The three Wyandottes each laid over 60 eggs

from November 1 to March 1. Fourteen Rocks and five Leghorns passed the 50-egg mark during the same time. These, with some others, are being pedigreed and are mated to males from over 230 record hens. All birds on the plant are trap-nested and only those showing high records are bred from. There have been a great many inquiries for hatching eggs, but, owing to a limited supply, all orders could not be filled. Day-old chicks were also asked for, but could not be supplied. Some customs hatching was done in the Candee incubator, which is giving good satisfaction. Last spring a Buckeye Colony brooder was purchased and is giving much greater satisfaction than the Candee brooder, being more sanitary, more economical in coal consumption and giving no trouble with the fire damping out.

As a protection for baby chicks against crows, a string covered yard was arranged in front of the brooder house. The strings were run about a foot apart from end to end of the yard, seven feet above the ground. This arrangement cost very little and was effective. Under this protection more chicks had to be culled, so apparently, in former seasons, the crows had been taking the weaklings.

Standard screenings were used as the main hopper feed for the growing chicks with fair results. As scratch feed they are unsatisfactory, but ground and used in the hopper mash make a good substitute for shorts.

The hatching results of confined versus free range birds showed two per cent higher fertility for the confined birds, both with hens and pullets, but the hatchability and livability was very low compared to the free range birds.

BEES.

The season's work commenced with five colonies. Two of these lost their queens in midsummer and deserted their hives. The three remaining colonies produced an average of 74 pounds of extracted honey. One hive was placed on the scales and a daily record kept of its loss or gain in weight.

FIELD HUSBANDRY.

Rotations.—The four-year rotation of hoed crop, grain, hay and pasture has been continued with increasingly good results. Each field is gradually being enlarged as more land is cleared, which permits the boundary fences to be pushed further back and in many instances straightened and squared. Previously the barnyard manure was applied for the hoe crop, but early this spring a light application was spread on the hay meadow, resulting in a splendid appearance of the field at present.

Crop yields.—The following table shows the amount of each crop grown in 1918:—

Crop.	Yield.	
	Tons.	Lbs.
Corn silage	103	1,725
Clover silage	127	1,600
Pea and oat silage	78	1,605
Clover hay	73	285
Green feed	31	760
Mangels	92	1,460
Carrots	4	1,850
Sugar beets	1	1,225
Potatoes	10	600
Mixed grains	26	1,200
Oats	6	1,500
Peas	1	300
Barley		1,750

Cultural Experiments.—The cultural work was carried on as formerly on the 146 plots set aside for the purpose. The crop yields on all plots were very poor owing to the character of the season.

FERTILIZER EXPERIMENTS.

A fertilizer experiment designated "E7" was started in 1918, the object being to get some information on the most economical combinations of different fertilizers to use on a three-year crop rotation. A great variation in yields of mangels was obtained. A permanent check plot which has not had manure or fertilizer for a number of years did not produce a single mangel, while some of the plots produced a crop of over twenty tons per acre. In almost every instance the heavier applications produced greater yields, but they were not always the most profitable. Whale guano did not produce as heavy crops nor as profitable crops of either corn or mangels as did nitrate of soda.

CEREALS.

The variety testing of cereals was continued on much the same plan as formerly. The plots were sown on April 20 and some of the early barley was harvested in July. Eleven varieties of oats were tested. The old favourites, Banner and Gold Rain, did very poorly. Victory and Lincoln were the best yielders with 66 bushels 6 pounds, and 65 bushels 10 pounds per acre respectively. The early varieties, Daubeny and Eighty-day, matured in 103 days, the former yielding slightly better than Eighty-day. Of the eleven barleys tested the six-row varieties did better than usual. Gold again headed the list, Duckbill Ottawa 57 being the second two-row variety; Oderbruck and O.A.C. No. 21 were the best six-rowed varieties. Of the six varieties of peas tested Solo was again the best yielder, followed by Golden Vine, Prussian Blue, Arthur, Chancellor and Picton. A mixture of Solo peas and Banner oats gave a better yield than Arthur peas and Banner oats.

FORAGE CROPS.

Root seed.—Extensive work in mangel steckling and mangel seed growing was accomplished. Two-thirds of an acre of Half Sugar White mangel seed was grown, the roots being set in rows three feet apart and planted eighteen inches apart in the rows. The amount of seed obtained was 1,200 pounds. One half an acre of Danish Sludstrup mangel seed was also produced from plants set three feet apart each way, the yield being 800 pounds. Twenty-four acres of the Yellow Leviathan variety of stecklings were also grown. This entailed a great deal of labour and expense, including rent of land, manual and horse labour, fertilizer and lumber. An excellent crop of stecklings was grown and at date of writing sufficient of them have been distributed to farmers in the Province to plant forty-four acres for seed. A large quantity is still on hand.

Roots.—Owing to the extra amount of labour in connection with root seed growing variety test work with forage crops was considerably reduced. Corn tests were eliminated entirely. Four varieties of mangels, three of carrots and five of sugar beets were tested. Giant Sugar mangel, Improved Short White carrot, and Ontario sugar beet proved to be the best yielding varieties.

Grasses and clovers.—The grass and clover mixtures sown in 1915 yielded only one crop. A mixture consisting of Red clover 9 pounds, Alsike three and a half, Dutch one and a half, Timothy one and a quarter, and Meadow Fescue one and a quarter pounds gave the best returns, followed by a mixture comprised of Red clover ten pounds and Alsike two pounds. The heaviest seeding of alfalfa gave the best results, while the lightest seeding yielded the poorest crops.

HORTICULTURE.

Following a milder winter than usual, the spring of 1919 was good for garden work and the land was well prepared for the ensuing season. The orchard and orna-

mental trees and shrubs recovered somewhat from their hard usage of the winter ice storms of 1917. Rhododendron, azaleas, magnolias, hydrangeas and dogwoods blossomed freely and were much admired.

Fruits.—This was a very good small fruit year and, with the exception of the strawberries, all varieties, particularly currants, yielded large crops. Plums and cherries bore well and a few of the apple trees had small crops.

Vegetables.—The vegetable work consisted of the usual tests in growing potatoes in various ways both cultural and from seed sprouted, unsprouted and cut, and variety test of potatoes.

The rest of the vegetable work was confined to growing seed and a quantity of seed was grown from the annual vegetables, and roots for seed growing in the following year were grown and harvested and have since been replanted for bearing seed in 1919.

Flowers.—Roses were exceptionally fine. The very dry June favoured the flowering and did not produce any mildew as might have been expected. Perennials bloomed well and the annuals were good, particularly those grown from seed raised at the Experimental Station at Summerland, B.C. Very little seed could be saved however owing to the very wet weather in the autumn.

FARM IMPROVEMENTS.

Buildings.—The old gangway at the rear of the main barn was removed and a new and more substantial one was erected in its place, having cement bases with plank platform. The main barn and Superintendent's house were painted.

Fencing.—The usual repair work and transferring of temporary fences was done, no permanent fences being erected.

Land Clearing.—The three acres of land stumped and cleared last year were levelled and ploughed in time to plant to peas and oats for green feed. After this crop was harvested it afforded considerable pasture for the sheep. Two more acres of underbrushing and one more acre of stumping were done at odd times during the year. Approximately one acre of new land was put into shape for cropping.

EXHIBITIONS.

The travelling exhibit from this farm was shown at only one local fair during the season, Matsqui. A large exhibit of cattle and sheep was shown at Vancouver Fair, which assisted greately in the advertising of the work of the farm in British Columbia and elsewhere.

MEETINGS.

The writer attended the following Fairs and meetings: Vancouver Board of Trade "Get Together" meeting, Dr. Williams lecture, Essondale, Annual Meeting of British Columbia Holstein Friesian, Duncan; Vancouver Exhibition, Mosquito Convention, Mission; Chilliwack School Garden Competition; Sheep sale, Kamloops; Annual Meeting Chilliwack Agricultural Society; Dairymen's Convention, Kelowna; Seed Grower's Convention, Kelowna; Annual Meeting Westminster Fair Association; Fraser Valley Seed Grower's Meeting, Chilliwack; Calgary and Edmonton Spring Horse Shows.

VISITORS.

It is estimated that 2,000 people visited the Farm during the year.

EXPERIMENTAL STATION FOR VANCOUVER ISLAND, B.C.

REPORT OF THE SUPERINTENDENT, LIONEL STEVENSON, M.S.

SEASONAL NOTES.

The climatic conditions experienced during the year were favourable to crop production with one exception, the lack of sufficient moisture during the April to September period to give an average yield. The soil dried quickly and the spring seeding completed three weeks earlier than in 1917, was followed by cool, dry weather. The autumn-seeded crops which suffered considerable by heaving during February, 1918, were slow in making recovery. Corn and roots did not develop well. Permanently established, deep-rooted plants withstood the soil dryness with but little injury. The experience of the year points more strongly than ever towards autumn seeding and specializing in permanently established plantations where such can be operated. More autumn-sown fodder crops and grains, more loganberries and strawberries and more thorough orchard practice are recommended for this district.

METEOROLOGICAL RECORDS.

Month.	Temperature F.			Precipitation.				Sunshine.
	Mean.	Highest.	Lowest.	Rainfall.	Snowfall.	Total.	Highest in 24 Hours.	
1918.	°	°	°	Inches.	Inches.	Inches.	Inches.	Hours.
April	47·5	69·0	31·0	0·21		0·21	0·16	255·48
May	52·1	75·0	35·0	0·44		0·44	0·14	244·30
June	60·5	82·0	37·0	0·45		0·45	0·22	317·18
July	62·5	84·0	44·0	0·96		0·96	0·26	287·06
August	60·5	77·0	45·0	1·41		1·41	0·30	256·30
September	59·0	81·0	41·0	0·16		0·16	0·16	223·54
October	49·9	64·0	39·0	2·73		2·73	0·73	103·48
November	42·8	54·0	32·0	3·34		3·34	0·63	49·06
December	38·8	51·0	29·0	6·77		6·77	2·34	59·18
1919.								
January	39·5	52·0	28·0	4·45		4·45	0·87	43·18
February	33·4	51·0	26·0	3·76	2·60	4·02	0·71	60·00
March	41·9	62·0	29·0	3·17	2·50	3·42	0·82	130·30
Total for year				27·85	5·10	28·36		2,029·06
Average for year						2·36		169·25

LIVE STOCK.

Horses.—Four work geldings are kept and are used exclusively for land tillage and Station improvement work. These horses have been maintained in good condition through the year on the following ration, April to September 30, for each 100 pounds weight of horse, 1 pound of crushed oats, 4 ounces of wheat bran and 1 pound of mixed clover and timothy hay were fed, from October 1 to January 31, rye hay was used, and from February 1 to March 31 oat straw was used instead of mixed or rye hay. These horses worked through the year at regular farm work or teaming gravel or stone.

Cattle.—The Jersey herd established in December, 1916, has been maintained in good condition. The herd was twice subjected to the tuberculin test and no reactions were found on either occasion. Only one cow exceeded the 400-pound fat standard set

for the herd. The heifers sired by the herd bull, a son of Rosalind of Old Basing, have not developed as satisfactorily as we had hoped for. The demand for young bulls has not been active, females were in good demand. The last two calves born were females.

Swine.—One choice Berkshire sow was added to the live-stock equipment early in the year. Six very fine young Berkshires were reared, four of which were sold for breeding purposes.

Poultry.—The work in the poultry department was largely a continuation of the preceding year's plan. Good progress has been made in pedigree breeding and high standards attained. The breeding pens are headed by cockerels having mothers with egg records of 257 and 261 eggs in the pullet year. Provision has been made to keep up and increase the present high egg-laying standard of the flock. Costs of production in the various operations were obtained. All birds have been trapnested throughout the year. Fertility experiments relating to individual fowls have been instituted. Four makes and types of incubators have been under observation and record. Considerable stock was sold for breeding purposes or transferred to other Stations. A heavy demand for hatching eggs and breeding stock was experienced during the year.

Apiary.—The colonies wintered in case-covered hives on their summer stand. Coming through the previous winter in good condition, the bees started early and gathered a surplus averaging 50 pounds per hive. This was the largest yield in five years. The honey was disposed of in the extracted condition. The result of the past five years' apiary work indicate that island conditions do not favour extensive bee-keeping.

FIELD HUSBANDRY.

Rotations.—The following rotations are under test:—

Two-year—Oats, peas, vetch for hay or silage-clover.
Three-year—Oats, sweet clover and vetch-beans.
Four-year—Corn, wheat, clover, clover.
Four-year—Oats, peas and vetch for silage, wheat or oats, clover, clover.

Crop Yields.—The total area in grain including test plots was 29 acres. Autumn wheat yields varied with varieties and locations from a minimum of 21¼ bushels to a maximum of 24 bushels in test plots, with a field average of 19½ bushels.

CEREALS.

Spring wheat yields in the test plots were very low owing to the dry, cold weather of April and the continued drought for the remainder of the growing season, the yields varied from 655 pounds to 775 pounds per acre. The straw was uniformly short with all varieties. The Marquis variety headed the list for productiveness.

Peas.—All legumes do well in the district and the pea varieties gave a better average under the adverse weather conditions than did any other class of cereals. Yields varied from 815 pounds to 1,245 pounds per acre. The Solo variety headed the list for productiveness.

Oats.—The autumn-sown crops yielded the heaviest in spite of the fact that 50 per cent of the plants winter-killed. O. A. C. 72, autumn-sown, yielded 1,015 pounds; spring-sown 680 pounds per acre and other varieties showed equal variation in yield.

Of the autumn-sown varieties, the Eclipse, a favourite Californian oat, headed the list of winter oats with a yield of 1,165 pounds per acre. The Ottawa Liberty Hulless is a very promising winter oat for this district.

Spring-sown varieties, nine in number, gave yields much below normal and varying from 160 pounds to 680 pounds per acre.

Rye.—The rye plots suffered greatly from spring heaving. Yields were very low, varying from 495 to 460 pounds per acre. Thousand-fold has proved to be the best yielder over a period of five years.

Autumn Wheat.—Of the eleven varieties of autumn-sown wheats under test, Sun headed the list with Dawson's Golden Chaff second. Marquis and Blue Stem made excellent showing as autumn wheats. Yields varied from 1,490 pounds to 2,360 pounds per acre.

Barley.—Two types were under test in both autumn and spring sown plots. Beardless and hulless varieties only were used. The autumn-sown plots were much superior to the spring plots. Yields were low.

The following classes of grains were tested in regular test plot work:—

	Number of Varieties.	Head of List.
Winter wheats	Eleven varieties	Sun.
Spring wheats	Nine "	Marquis.
Winter barley	Three "	Blue Hulless.
Spring barley	Three "	Blue Hulless.
Winter peas	Three "	Solo.
Spring peas	Five "	Solo.
Winter oats	Five "	Eclipse.
Spring oats	Nine "	O. A. C. 72.
Winter rye	Four "	Thousand Fold.
Vetch and tares	One "	Golden Tares.

Cereal Breeding.—This work was started in 1916. Numerous crosses were made chiefly in wheats during 1918. The results of crosses made in 1916 and 1917 have been multiplied greatly by the reproduction of two seasons. Numerous head selections have been made.

FORAGE PLANTS.

Indian Corn.—Three varieties were under test as grain producers, all giving very satisfactory results. Palisade (the Experimental Station hybrid) gave a yield of 4,256 pounds of shelled corn per acre. King Philip 3,847 pounds per acre and Morse Hybrid Flint 3,718 pounds per acre. But one variety (Experimental Station hybrid) was tested for ensilage—height 9 to 12 feet—yield 11 tons 525 pounds per acre; ripened in 131 days.

Roots.—An attempt was made to grow stecklings of Danish Sludsdrup mangel; this was only partly successful owing to dry weather. Sufficient stecklings were produced to set two acres for seed production.

Mangels in seed were very successful. The stocks were set in October and seventy-five per cent wintered. These developed well and produced an excellent crop of high quality seed. The yield per acre was 2,600 pounds.

Carrot stecklings for seed production were set in October. These roots wintered without loss and gave a seed yield of 1,150 pounds per acre. An area of select Thousand-headed kale plants gave a seed yield of 2,425 pounds per acre. Experience of past years indicate that greater average results will be obtained from those root seed plants that are hardy enough to winter than may be expected from the spring planting of stecklings.

Alfalfa withstood the drought conditions better than any other plant. The best plot seeded in drills 30 inches apart gave a total yield in three crops of 11,132 pounds of

dry hay per acre. Four alfalfa varieties are under test. Distance of planting tests have been conducted during the past two years.

Swiss Chard.—A small area planted in April and irrigated at regular fifteen-day intervals during the season gave a green weight yield of 32,625 pounds per acre. These plants will be used for seed production in 1919.

Sugar Beets.—Four varieties were under test. The variety Ontario headed the list with a yield of 12 tons 355 pounds per acre. Helianthi Macrophyllum, the Australian artichoke, was established on a small area. A yield of 17,743 pounds per acre was taken on August 16. A second growth 15 inches high was recorded. Plots of Red, White, Alsike, Sweet and Egyptian clovers, Cocksfoot Tall oat grass and timothy were under test. Many varieties of grasses and clovers were discarded as being unsuited to island conditions. Only those varieties that can withstand a long period of dryness can be successful on the upland areas.

HORTICULTURE.

The orchards made very satisfactory growth during the year. A number of trees of the various kinds produced heavy crops of fruit and nuts. A mulching system has been introduced and for some years will be the orchard practice. In April the orchard area was seeded with peas and red clover. The green pea vine was cut in June and placed about the trees as a mulch. A very good stand of clover was obtained; this will be cut in June, 1919 and 1920 and used as a mulch. The orchard will be ploughed and reseeded every third year. The practice of clean cultivation has proven to be destructive of soil fertility in this district of wet, open winters and dry summer periods.

A number of useful apple seedlings have been located. A number of crosses between standard varieties of apples and pears have been made. Sour and Sweet cherries, plums, quinces, medlars and pears of excellent quality were ripened by numbers of various varieties. Apples, peaches, nectarines, apricots, were produced in abundance but of only fair quality. Very satisfactory yields were obtained from a large variety of bush and cane fruits. The strawberry, the loganberry and the black currant are the outstanding classes of small fruits for the district.

The production of vegetable seed received considerable attention throughout the season and splendid results were obtained both in the production of seed and the growing of stecklings.

The development of the various plantations of economics including holly, cascara, tea, eleagnus, filberts, persimmon and grapes was very satisfactory.

The nursery has been maintained and extended by small plantings of those varieties best suited to the district. Plant propagation has been largely confined to broadleaf evergreen shrubs and roses.

Twelve sample hedges were planted during January as a beginning on the hedge area.

The holly orchard and perennial flowering plants were moved from their location of 1917 to the ornamental grounds.

The arboretum progressed to the extent of a fair natural growth and a few conifer instructions. Many of the introduced deciduous shrubs and trees have not proven very vigorous under the intense dryness of the summer period in this district. All broadleaf evergreens, conifers and legumes do well here. The work with flowering bulbs was carried on as usual throughout the year. An area one-quarter acre in extent was treated with a two-inch coating of sand to improve tilth conditions for bulb growing. The bulb increases have been generally satisfactory for tulip and hyacinth varieties. The park shrubberies and trees made very satisfactory growth.

BUILDINGS.

Some repair work and painting was done to the existing structures. A small building 20 feet by 26 feet was erected for horticultural work and a silo 9 feet by 27 feet for experimental silage was erected.

FARM IMPROVEMENTS.

The removal of stones and roots from the fields, road improvement by gravelling and ditching and fence improvement received considerable attention throughout the year.

EXHIBITIONS.

The following exhibitions were supplied with the Station exhibit: Cowichan Agricultural Society, North and South Saanich Agricultural Society, Provincial Seed Fair at Kelowna, and a contribution toward a general exhibit at the Vancouver Exhibition.

MEETINGS ATTENDED.

The superintendent attended and acted as judge of exhibits at the following fairs and exhibitions: South Saanich, North Saanich, West Saanich, Garden City, Tillicum flower and garden produce exhibitions. The Cowichan Agricultural Society Exhibition, the Nanaimo Agricultural Society Fair, the North and South Saanich Agricultural Society Exhibition, the Vancouver Exhibition, and the provincial seed fairs at Kelowna and Duncan.

The superintendent attended by invitation and delivered addresses at the following organizations' meetings: Farmers' and Womans' Institutes, Board of Trade, Greater Production, Dairymen's Convention, Seed Growers' Convention and meetings and short course in agronomy at University of British Columbia.

VISITORS.

Many large picnic parties visited the station during July and August. Numerous individual visitors from various parts of Canada and the United States called, seeking information relative to local conditions. The estimated aggregate of all visitors for the year is 3,400 people.

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